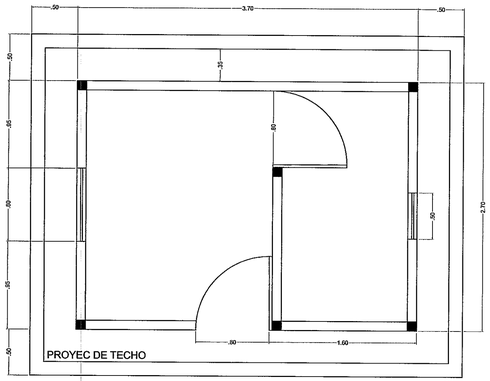
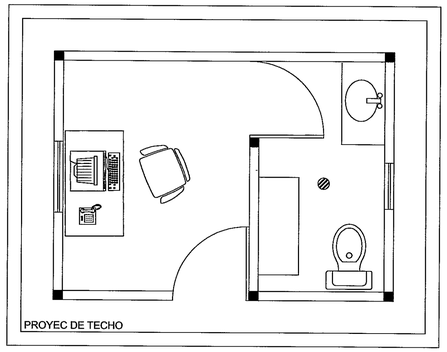


PLANTA ARQUITECTONICA
GARITA DE SEGURIDAD



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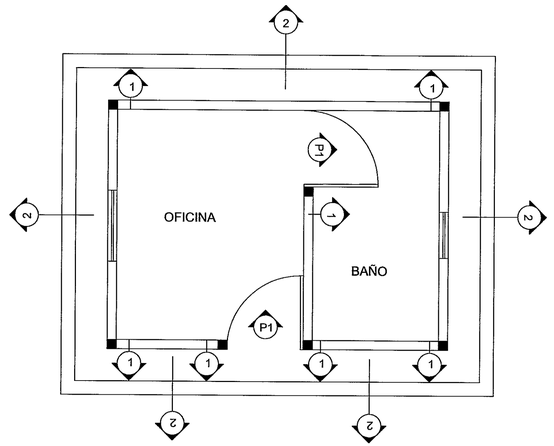
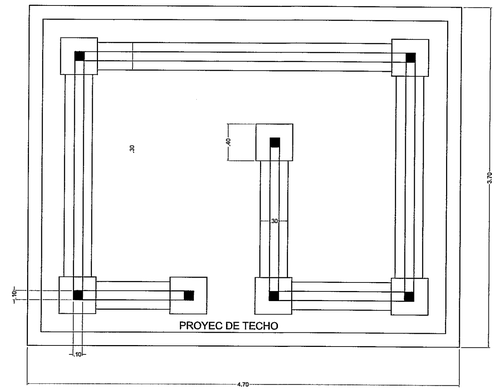
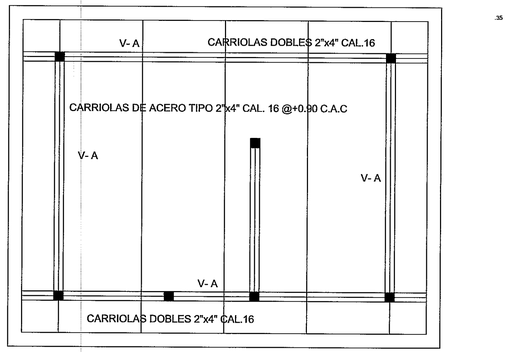
GARITA DE SEGURIDAD



PLANTA DE CIMIENTOS GARITA DE
SEGURIDAD



PLANTA DE FUNDACIONES
GARITA DE SEGURIDAD



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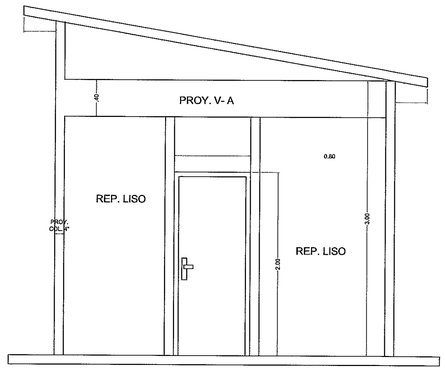
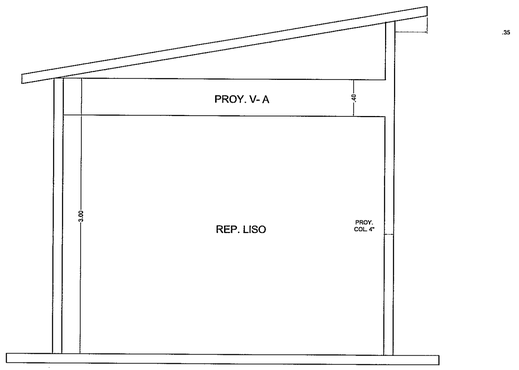
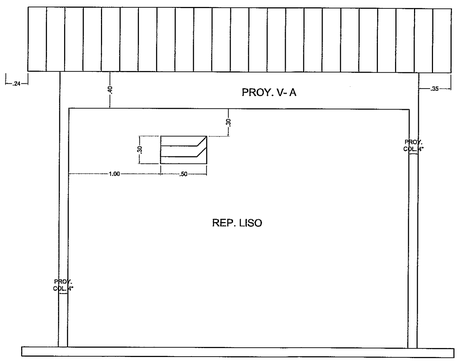
GARITA DE SEGURIDAD



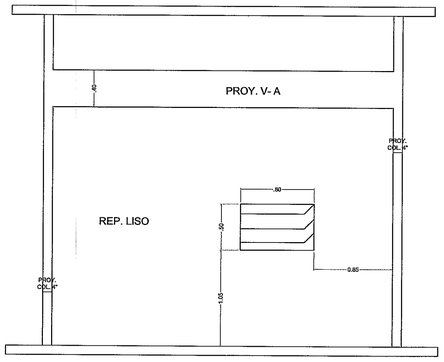
ELEVACION FRONTAL
GARITA DE SEGURIDAD



ELEVACION POSTERIOR
GARITA DE SEGURIDAD

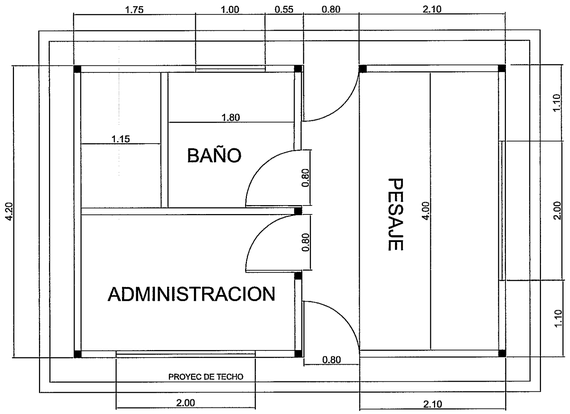


VISTA LATERAL IZQUIERDA
GARITA DE SEGURIDAD

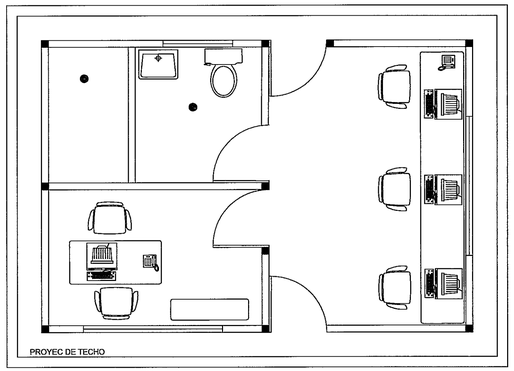


VISTA LATERAL DERECHA GARITA DE
SEGURIDAD

LOSA 0.08
.15
.15
.15



PLANTA ARQUITECTONICA
OFICINA ADMINISTRATIVA



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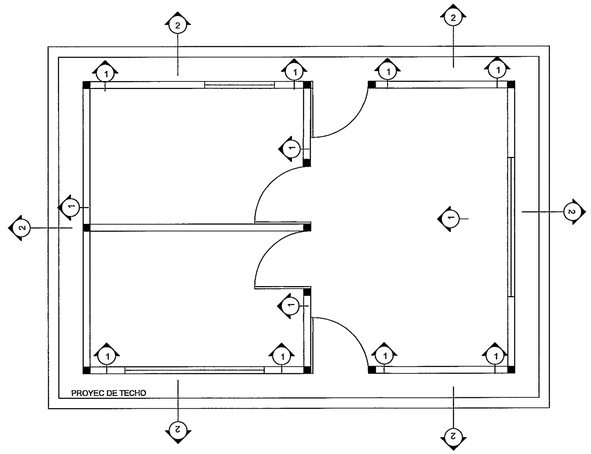
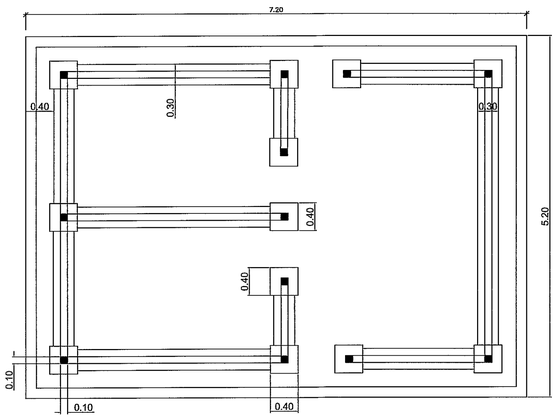
OFICINA ADMINISTRATIVA



PLANTA DE CIMIENTOS OFICINA
ADMINISTRATIVA



PLANTA DE FUNDACIONES OFICINA
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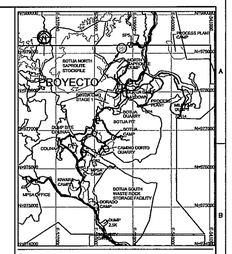
PROYECTO
BOTIJA NORTE STOCKPILE
BOTIJA STOCKPILE
BOTIJA PLANTA
BOTIJA PIT
BOTIJA SOUTH STOCKPILE
BOTIJA SOUTH WASTE/OVERBURDEN STOCKPILE
COLINA
CERRO CORTO GRANDE
CERRO CORTO
EL DORADO
EL DORADO CAMP
PLANTA EL DORADO
EL DORADO STOCKPILE
LA LATA
LA LATA CITICE
LA LATA STOCKPILE
LA LATA WASTE/OVERBURDEN STOCKPILE
LA LATA PIT
LA LATA CAMP
CERRO CORTO STOCKPILE
CERRO CORTO WASTE/OVERBURDEN STOCKPILE
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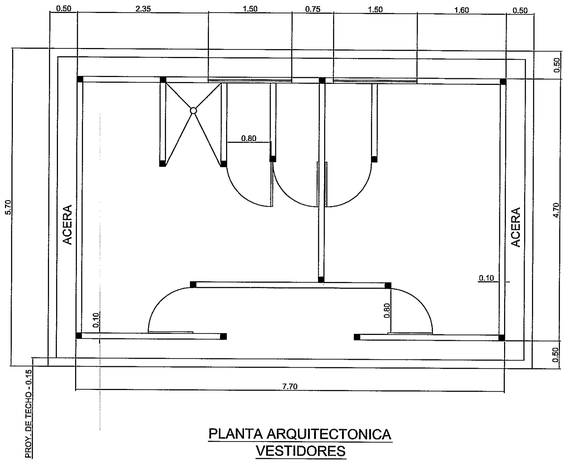
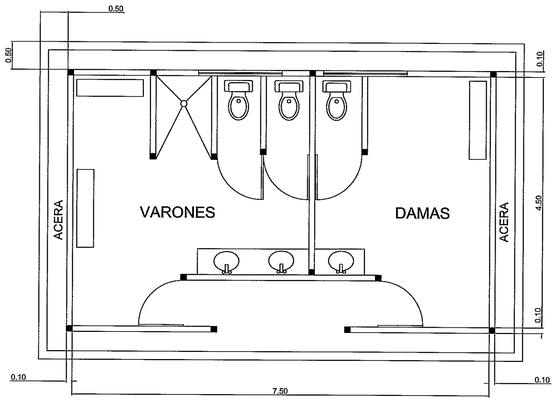
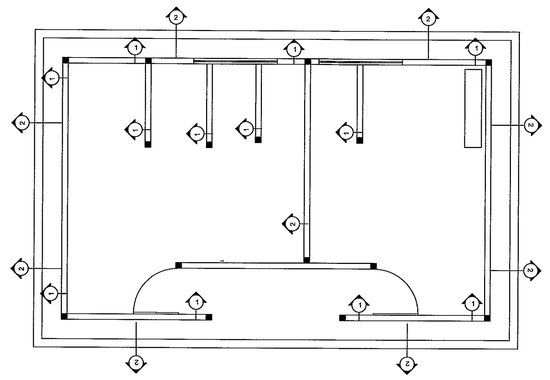
CERRO CORTO TAILINGS STOCKPILE
CERRO CORTO TAILINGS FACILITY



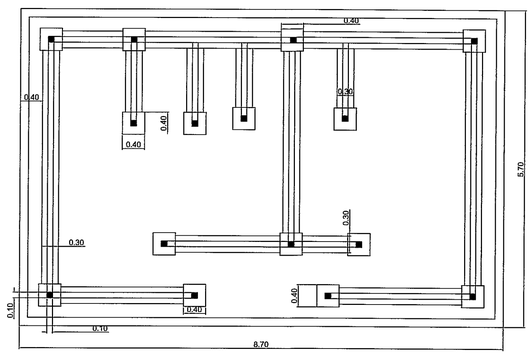
PLANTA ARQUITECTONICA
VESTIDORES



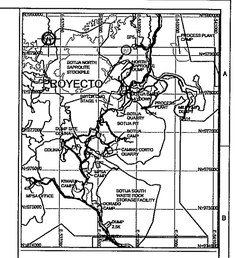
PLANTA ARQUITECTONICA
VESTIDORES



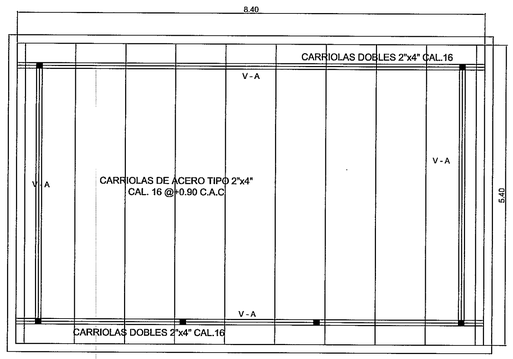
PLANTA DE CIMIENTOS
VESTIDORES



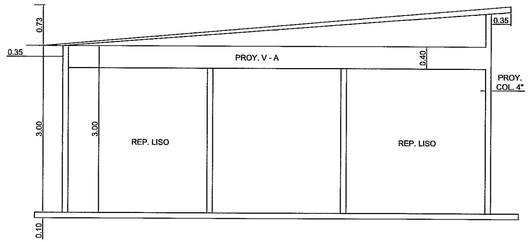
PLANTA DE FUNDACIONES
VESTIDORES



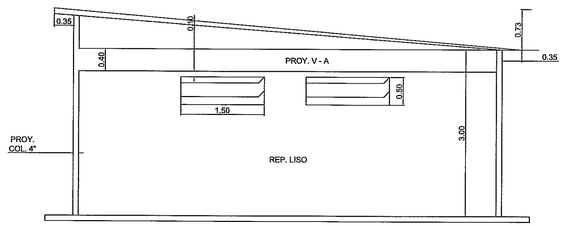
LOCALIZACION REGIONAL
ESC. 1:50,000



PLANTA DE TECHO DE
VESTIDORES



ELEVACION FRONTAL DE
VESTIDORES



ELEVACION POSTERIOR DE
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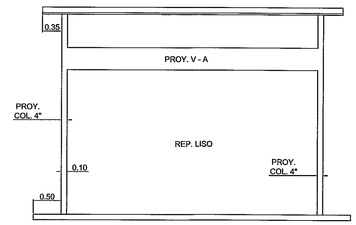
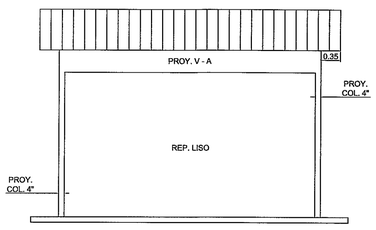


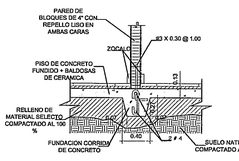
ELEVACION LATERAL IZQUIERDO
DE VESTIDORES



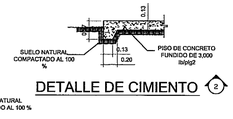
ELEVACION LATERAL DERECHA
DE VESTIDORES

NOTAS CONSTRUCTIVAS

-EL CONCRETO SERA TIPO 1 DE HORMIGON Fc=3000#/PLG2 PARA ACERAS
-TODO EL ACERO DE REFUERZO SERA GRADO 60
-LAS SUPERFICIES METALICAS EXPUESTAS QUE NO SEAN DE ACERO INOXIDABLE SERAN CUBIERTAS CON DOS MANOS DE PINTURA ANTICORROSIVA
EL TRASLAPE ENTRE LAS LAMINAS DE MALLAS ELECTROSOLDADAS SERA DE 0.15M

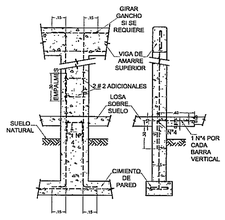


DETALLE DE CIMIENTO (1)

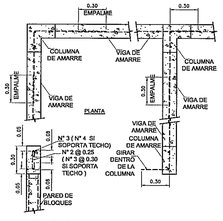


DETALLE DE CIMIENTO (2)

INTERSECCIONES EN
PLANTA DE CIMIENTO
DE PAREDES



DETALLES TIPICOS DE COLUMNA
DE AMARRE

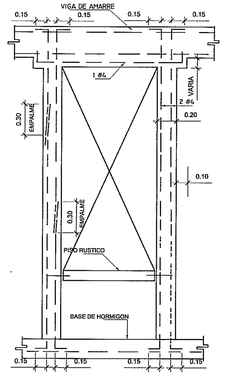


SECCION TRANSVERSAL
DETALLES TIPICOS DE VIGAS DE AMARRE

SECCION ELE

SECCION
RECTANGULAR

DETALLES TIPICOS DE
COLUMNA DE AMARRE



REFUERZO ALREDEDOR DE
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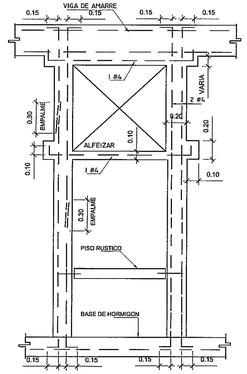
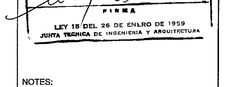


REFUERZO ALREDEDOR
DE VENTANAS


ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88-04-3
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 5.00m

DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D	REV	DATE	DESCRIPTION
							ISSUED FOR INFORMATION

DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

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DRAWING TITLE: DETALLES DE VESTIDORES

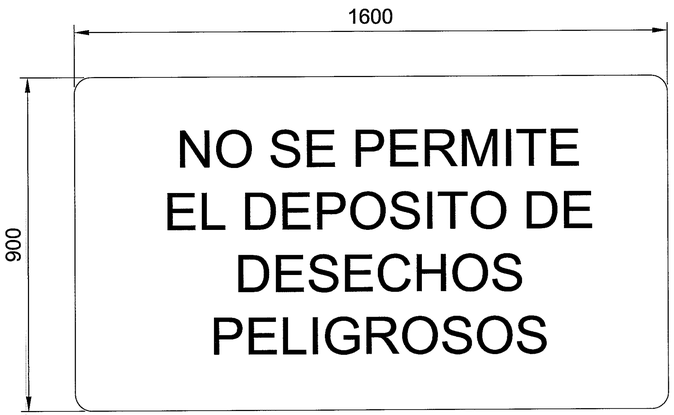
SCALE	JOB No.	DRG No.	REV.
1:50		1824-827-CI-8027	00

DRAWN | DATE

AVISO DE ENTRADA AL RELLENO

UNIDADES EN MILIMETROS
S/E

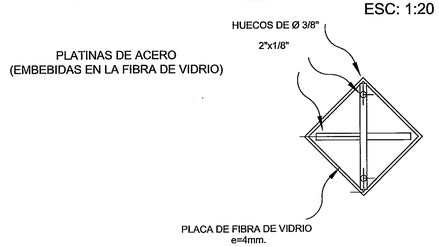
AVISO DEL TIPO DE RESIDUOS DEPOSITABLES



UNIDADES EN MILIMETROS
S/E

AVISO DEL TIPO DE RESIDUOS DEPOSITABLES

ESC: 1:20



SEÑALES DE TRÁNSITO

ESC: 1:2000

SEÑAL DE UBICACION DE POZO DE RECOLECCION DE GASES

ESC: 1:7.5

UNIDADES EN MILIMETROS
S/E

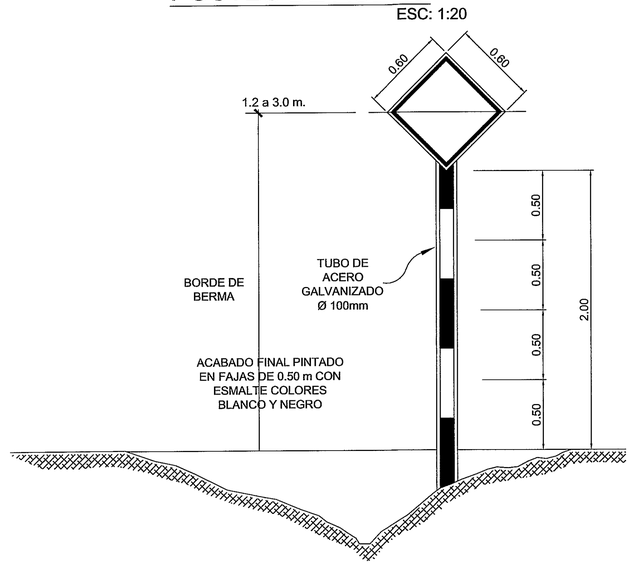
AVISO DEL TIPO DE RESIDUOS DEPOSITABLES

ESC: 1:1000

UNIDADES EN MILIMETROS

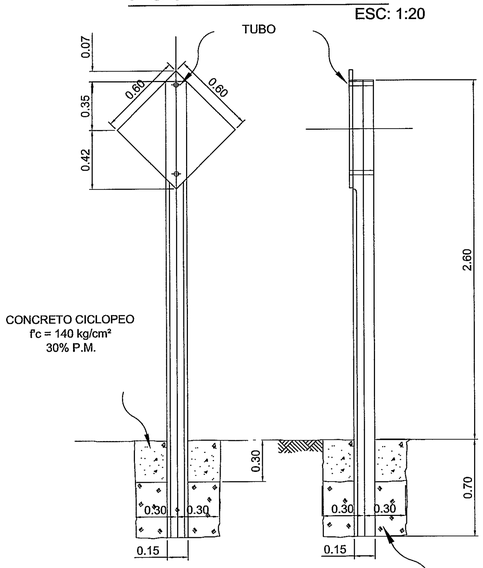
DISEÑO ESTRUCTURAL DE POSTES DE ACERO

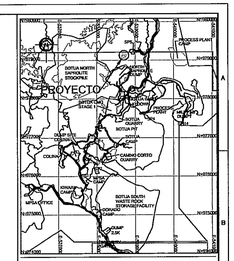
ESC: 1:20



DISEÑO ESTRUCTURAL DE POSTES DE ACERO

ESC: 1:20





LOCALIZACION REGIONAL
ESC. 1:50,000

ERICK N. VALLESTER E.
INGENIERO CIVIL
Ide. No. 88,046-70
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.

DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
				ISSUED FOR INFORMATION							

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

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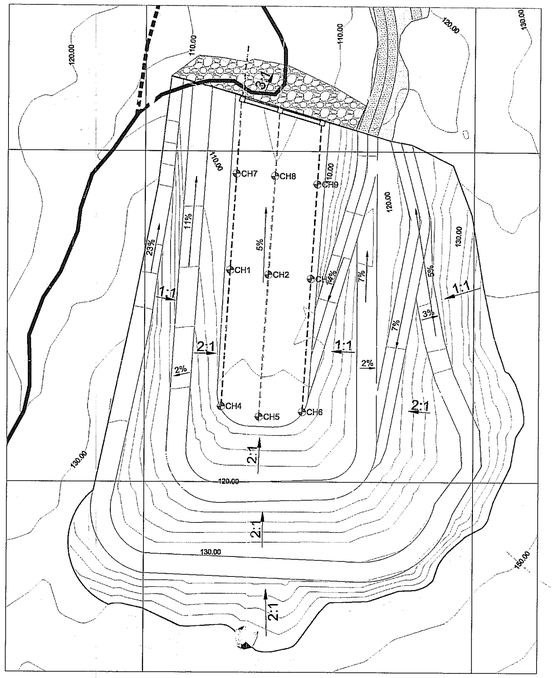
DRAWING TITLE: SEÑALIZACIONES

SCALE	JOB No.	DRG No.	REV.
INDICADA		1824-827-CI-8028	00

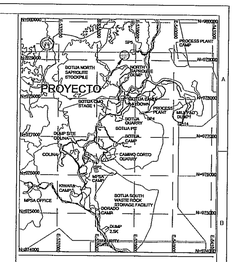
DRAWN | DATE

PROYECTO RELLENO SANITARIO DE MINERA PANAMA S.A.



NUMERO DE DIBUJO	DESCRIPCIÓN
1824-827-CI-8001	INDICE
1824-827-CI-8002	UBICACIÓN GENERAL Y DELIMITACIÓN DEL PROYECTO
1824-827-CI-8003	TOPOGRAFÍA Y DISTRIBUCIÓN DEL PROYECTO
1824-827-CI-8004	VISTA GENERAL DEL PROYECTO
1824-827-CI-8005	PLANTA PERFIL - CALLE DE ACCESO
1824-827-CI-8006	PLANTA PERFIL - CALLE INTERNA
1824-827-CI-8007	VISTA ETAPA I
1824-827-CI-8008	VISTA ETAPA 2 - RELLENO
1824-827-CI-8009	SECCIONES TRANSVERSALES ETAPA I - CAPACIDAD
1824-827-CI-8010	SECCIONES TRANSVERSALES ETAPA 1 - CAPACIDAD
1824-827-CI-8011	SECCIONES TRANSVERSALES ETAPA 2 - CAPACIDAD
1824-827-CI-8012	SECCIONES TRANSVERSALES ETAPA II - CAPACIDAD
1824-827-CI-8013	SISTEMA DE RECOLECCION DE GASES Y LIXIVIADOS
1824-827-CI-8014	SISTEMA DE RECOLECCIÓN DE GASES
1824-827-CI-8015	SISTEMA DE RECOLECCIÓN DE LIXIVIADOS
1824-827-CI-8016	SISTEMA DE TUBERIAS DE RECOLECCION DE LIXIVIADOS - RELLENO A LAG. FACULTATIVA A LAG. MADURACION
1824-827-CI-8017	SISTEMA DE TRATAMIENTO DE LIXIVIADOS
1824-827-CI-8018	SISTEMA DE INTERSECCIÓN DE AGUAS PLUVIALES
1824-827-CI-8019	DETALLES DE TUBERIAS DE SISTEMA DE RECOLECCION DE LIXIVIADOS Y GASES
1824-827-CI-8020	DETALLES DE CAMARA DE INSPECCIÓN Y CABEZALES
1824-827-CI-8021	DETALLE DE GEOSINTETICOS
1824-827-CI-8022	UBICACIÓN DE POZOS PARA MONITOREO DE AGUAS SUBTERRÁNEAS E INFORMACIÓN GEOTÉCNICA
1824-827-CI-8023	DETALLE DE CERCA PERIMETRAL
1824-827-CI-8024	LOCALIZACIÓN DE EDIFICIOS
1824-827-CI-8025	DETALLES DE GARITA DE SEGURIDAD
1824-827-CI-8026	DETALLES DE OFICINA ADMINISTRATIVA
1824-827-CI-8027	DETALLES DE VESTIDORES
1824-827-CI-8028	SEÑALIZACIONES

PROYECTO DESARROLLADO POR:
CONSULTORIA, ESTUDIOS Y DISEÑOS, S.A
BAJO LA ORDEN DE COMPRA
No. 4500185429



LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CHIMENEAS
- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- AREA DEL PROYECTO
- PRESA / TALUD ENROCADO
- EMBALSE

ERICK M. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88-036-020
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECT.

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 1.00m

DRG No	REFERENCE DRAWINGS	DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
		ISSUED FOR INFORMATION							

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT MPSA
PROJECT MINA DE COBRE PANAMA
RELLENO SANITARIO

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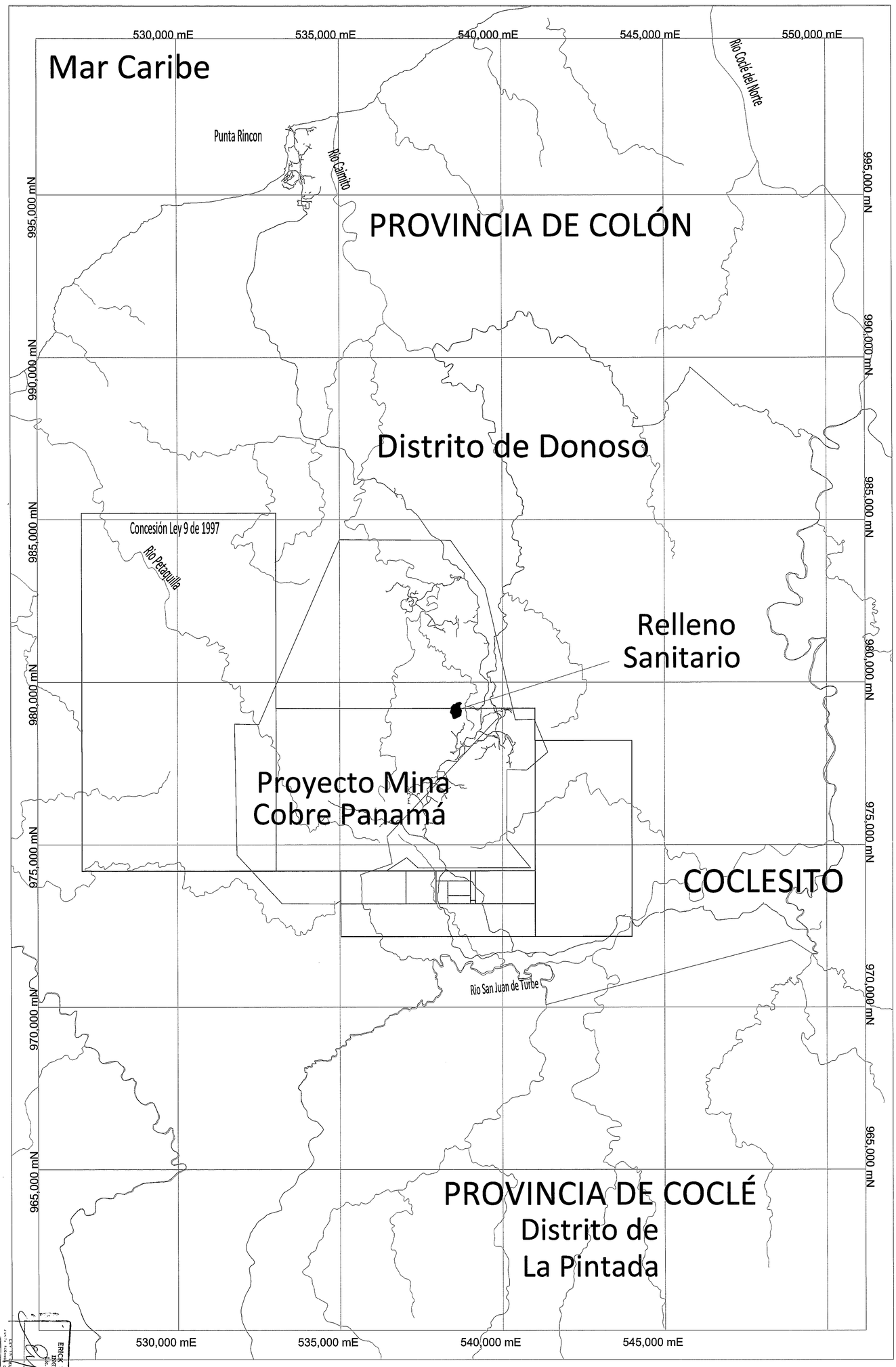
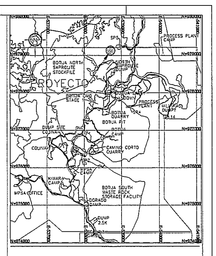
DRAWING TITLE
ÍNDICE

SCALE | JOB No. | DRG No. 1824-827-CI-8001 | REV. 00

DRAWN | DATE





LOCALIZACION REGIONAL
ESC. 1: 50,000

LEYENDA

- CHIMENEAS
- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- AREA DEL PROYECTO
- PRESA / TALUD ENROCADO
- EMBALSE

NOTES:

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2. CONTOURS 1.00m

ERICK N. VALLESTER E.
INGENIERO CIVIL
No. PAN. 20,191
PANAMA
LICENCIA DE USO EXCLUSIVO DE ESTUDIOS Y ANTEPROYECTOS

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

DRAWING TITLE: UBICACION GENERAL Y DELIMITACION DEL PROYECTO

SCALE:
JOB No.:
DRG No.: 1824-827-CI-8002
REV.: 00
DRAWN:
DATE:

DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

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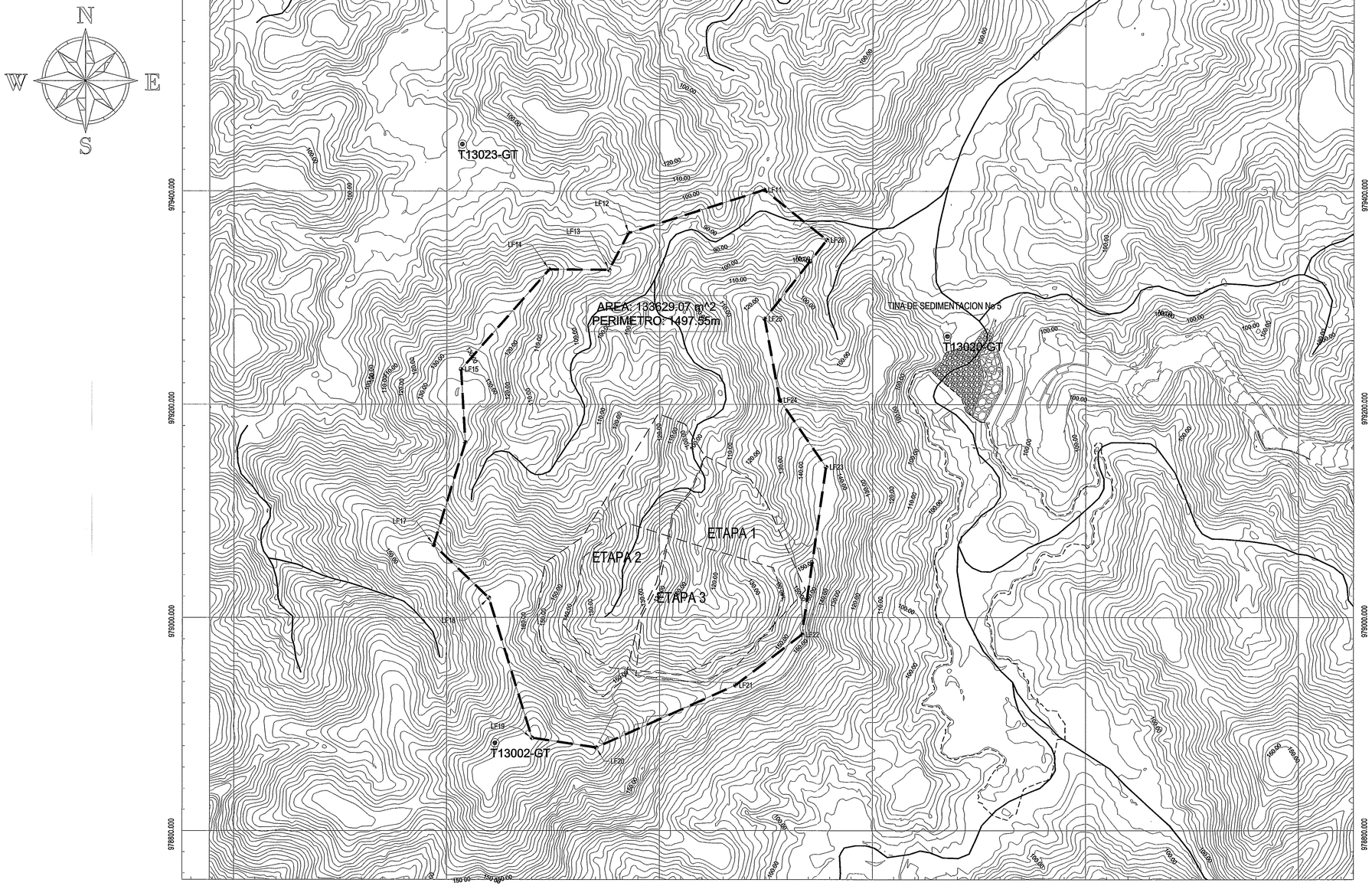


TABLA DE AREA DEL POLIGONO

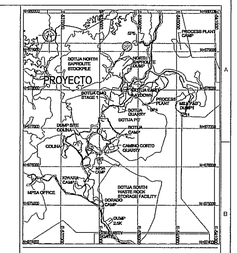
#	LONG	RUMBO	NORTE	ESTE
L1	125.03	S41° 28' 02.87"W	INICIO: 979326.528 FINAL: 979232.836	INICIO: 538496.197 FINAL: 538413.400
L2	68.58	S3° 20' 17.35"E	INICIO: 979232.836 FINAL: 979164.375	INICIO: 538413.400 FINAL: 538417.393
L3	100.94	S17° 08' 35.54"W	INICIO: 979164.375 FINAL: 979067.907	INICIO: 538417.393 FINAL: 538387.697
L4	71.72	S46° 19' 23.20"E	INICIO: 979067.907 FINAL: 979018.380	INICIO: 538387.697 FINAL: 538439.566
L5	137.28	S17° 12' 29.50"E	INICIO: 979018.380 FINAL: 978887.243	INICIO: 538439.566 FINAL: 538480.180
L6	61.02	S81° 21' 54.76"E	INICIO: 978887.243 FINAL: 978878.081	INICIO: 538480.180 FINAL: 538540.510
L16	143.22	N66° 00' 29.73"E	INICIO: 978878.081 FINAL: 978936.315	INICIO: 538540.510 FINAL: 538671.357
L7	78.54	N52° 46' 13.11"E	INICIO: 978936.315 FINAL: 978983.835	INICIO: 538671.357 FINAL: 538733.895
L8	159.87	N8° 07' 12.63"E	INICIO: 978983.835 FINAL: 979141.117	INICIO: 538733.895 FINAL: 538756.336
L9	76.55	N34° 41' 25.96"W	INICIO: 979141.117 FINAL: 979204.059	INICIO: 538756.336 FINAL: 538712.767
L10	77.37	N10° 30' 01.14"W	INICIO: 979204.059 FINAL: 979280.134	INICIO: 538712.767 FINAL: 538698.667
L11	94.22	N38° 15' 59.88"E	INICIO: 979280.134 FINAL: 979354.107	INICIO: 538698.667 FINAL: 538757.018
L12	75.23	N51° 22' 22.35"W	INICIO: 979354.107 FINAL: 979401.072	INICIO: 538757.018 FINAL: 538698.243
L13	133.66	S72° 24' 18.72"W	INICIO: 979401.072 FINAL: 979360.668	INICIO: 538698.243 FINAL: 538570.834
L14	39.04	S28° 03' 44.88"W	INICIO: 979360.668 FINAL: 979326.217	INICIO: 538570.834 FINAL: 538552.467
L15	56.27	N89° 40' 56.62"W	INICIO: 979326.217 FINAL: 979326.528	INICIO: 538552.467 FINAL: 538496.197

VERTICES DEL POLIGONO

PUNTO	NORTE	ESTE	DESCRIPCION
11	979401.072	538698.243	LF11
12	979360.668	538570.834	LF12
13	979326.217	538552.467	LF13
14	979326.529	538496.197	LF14
15	979232.836	538413.400	LF15
16	979164.375	538417.393	LF16
17	979067.907	538387.697	LF17
18	979018.380	538439.566	LF18
19	978887.243	538480.180	LF19
20	978878.081	538540.510	LF20
21	978936.315	538671.357	LF21
22	978983.835	538733.895	LF22
23	979141.117	538756.336	LF23
24	979204.059	538712.767	LF24
25	979280.134	538698.667	LF25
26	979354.107	538757.018	LF26

POZOS DE MONITOREO

#	POZO	ELEVACION	NORTE	ESTE
5	T13002-GT	188.57	978882.42	538445.34
6	T13023-GT	82.50	979444.02	538414.46
9	T13020-GT	88.00	979264.00	538870.00



LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- POZO
- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- AREA DEL PROYECTO
- PRESA
- EMBALSE
- VERTICES DEL POLIGONO

ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88-006-020
PIMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 1.00m

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

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TOPOGRAFIA Y DISTRIBUCION DEL PROYECTO

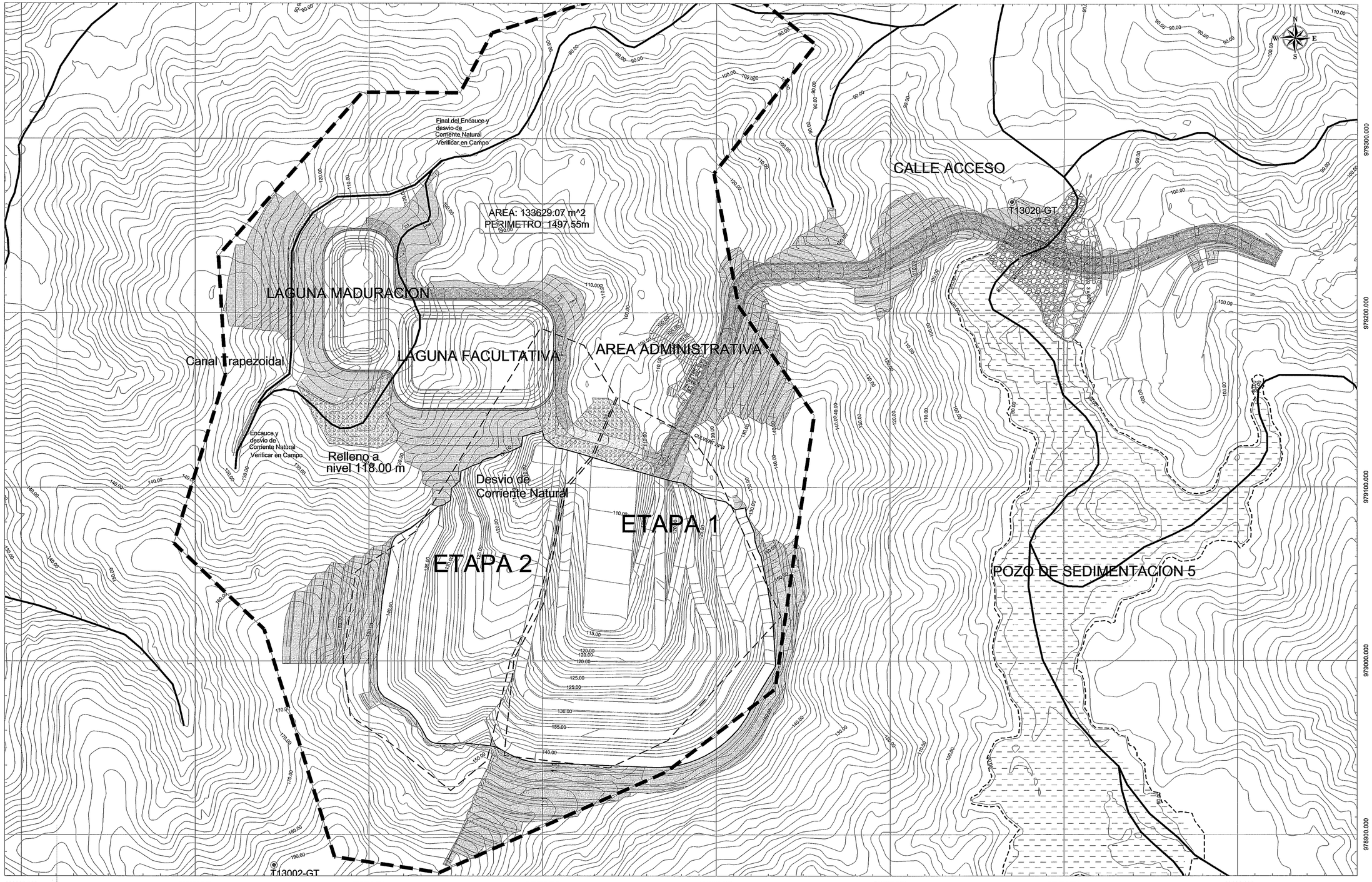
SCALE	JOB No.	DRG No.	REV.
1:2000		1824-827-CI-8003	00

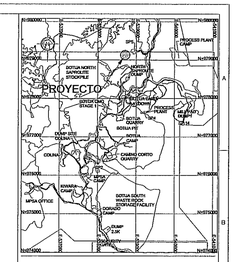
DRAWN | DATE

DRG No	REFERENCE DRAWINGS	DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

ISSUED FOR INFORMATION

REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D





LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CURVAS MAYORES
- CURVAS MENORES
- CALLES INTERNAS
- HIDROGRAFIA
- AREA UTILIZABLE
- PRESA / TALUD ENROCADO
- EMBALSE
- CURVAS MAYORES
- CURVAS MAYORES
- LIMITE DEL RELLENO

ERICK N. VALLESTER E.
INGENIERO CIVIL
Ley No. 55 de 27

FIRMA

LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

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2. CONTOURS 2.00m

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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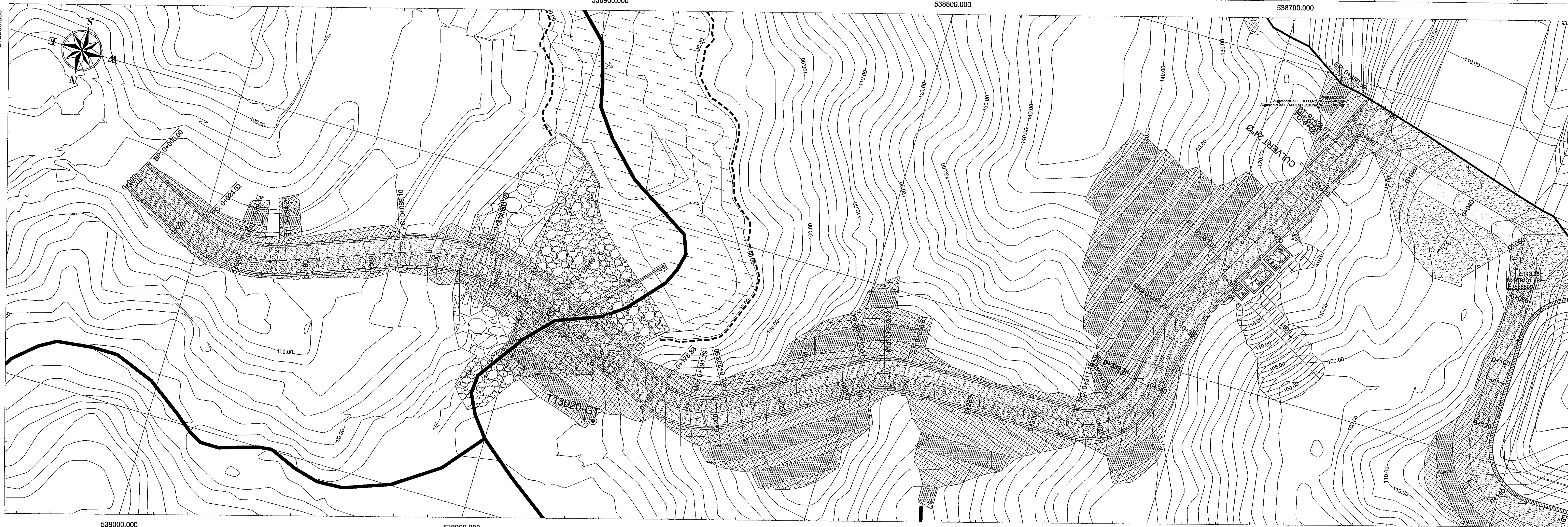
DRAWING TITLE: VISTA GENERAL DEL PROYECTO

SCALE: 1:1000
JOB No.:
DRG No.: 1824-827-CI-8004
REV.: 00
DRAWN:
DATE:

DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
				ISSUED FOR INFORMATION							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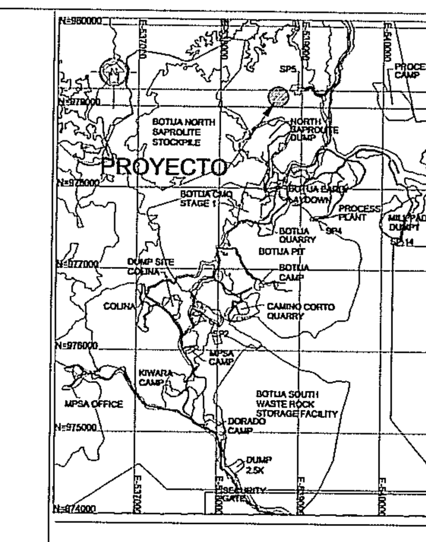
538900.000
538800.000
538700.000
979200.000
979300.000
979100.000
S
E
W
N
BP: 0+000.00
PC: 0+024.02
Mid: 0+039.14
PT: 0+054.26
PC: 0+089.10
Mid: 0+113.60
PT: 0+138.16
PC: 0+178.88
Mid: 0+191.39
PT: 0+203.90
PC: 0+246.84
Mid: 0+252.72
PT: 0+258.61
PC: 0+339.83
PT: 0+383.02
Mid: 0+361.22
EP: 0+450.39
T13020-GT
CULVERT 24"Ø
INTERSECCION
Alignment=CALLE RELLENO, Station=0+440.00
Alignment=CALLE ACCESO LAGUNA, Station=0+000.00
Z:113.25
N: 979131.88
E: 538599.71
100.00
110.00
120.00
130.00
140.00
90.00
115.00
105.00

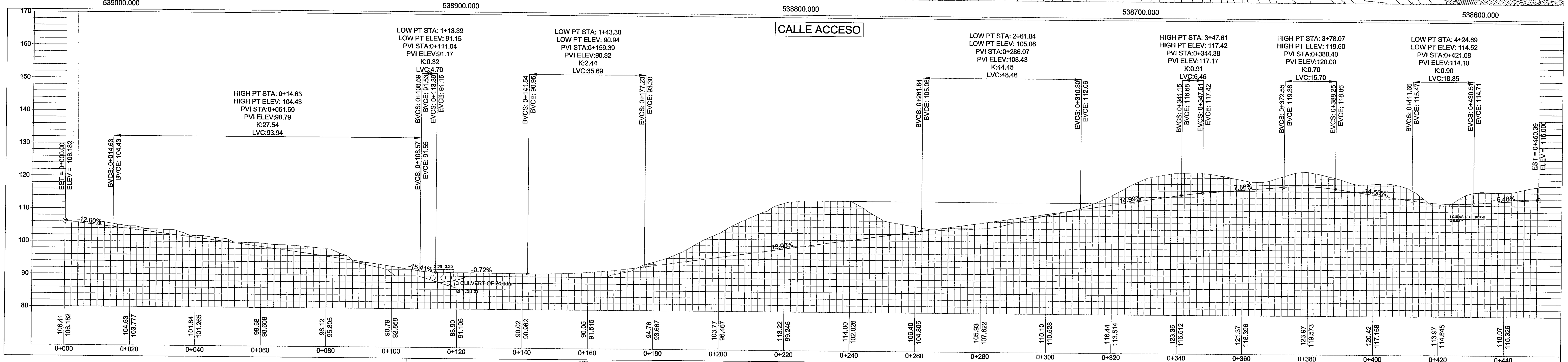

PROYECTO
BOTIJA NORTH SAPROLITE STOCKPILE
NORTH SAPROLITE DUMP
PROCESS PLANT CAMP
PROCESS PLANT
BOTIJA PIT
BOTIJA CAMP
CAMINO CORTO QUARRY
MPSA CAMP
KIWARA CAMP
MPSA OFFICE
BOTIJA SOUTH WASTE ROCK STORAGE FACILITY
DORADO CAMP
COLINA
DUMP SITE COLINA

LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- POZO
- CURVAS MAYORES
- CURVAS MENORES
- CENTRO DE CARRETERA
- RODADURA
- BANQUETA
- HIDROGRAFIA
- TALUD
- PRESA / TALUD ENROCADO
- EMBALSE
- RASANTE
- TERRENO NATURAL

CALLE ACCESO


539000.000
538900.000
538800.000
538700.000
538600.000
CALLE ACCESO
HIGH PT STA: 0+14.63
HIGH PT ELEV: 104.43
PVI STA:0+061.60
PVI ELEV:98.79
K:27.54
LVC:93.94
LOW PT STA: 1+13.39
LOW PT ELEV: 91.15
PVI STA:0+111.04
PVI ELEV:91.17
K:0.32
LVC:4.70
LOW PT STA: 1+43.30
LOW PT ELEV: 90.94
PVI STA:0+159.39
PVI ELEV:90.82
K:2.44
LVC:35.69
LOW PT STA: 2+61.84
LOW PT ELEV: 105.06
PVI STA:0+286.07
PVI ELEV:108.43
K:44.45
LVC:48.46
HIGH PT STA: 3+47.61
HIGH PT ELEV: 117.42
PVI STA:0+344.38
PVI ELEV:117.17
K:0.91
LVC:6.46
HIGH PT STA: 3+78.07
HIGH PT ELEV: 119.60
PVI STA:0+380.40
PVI ELEV:120.00
K:0.70
LVC:15.70
LOW PT STA: 4+24.69
LOW PT ELEV: 114.52
PVI STA:0+421.08
PVI ELEV:114.10
K:0.90
LVC:18.85
EST = 0+000.00
ELEV = 106.182
BVCS: 0+014.63
BVCE: 104.43
EVCS: 0+108.57
EVCE: 91.55
BVCS: 0+108.69
BVCE: 91.53
EVCS: 0+113.39
EVCE: 91.15
BVCS: 0+141.54
BVCE: 90.95
EVCS: 0+177.23
EVCE: 93.30
BVCS: 0+261.84
BVCE: 105.06
EVCS: 0+310.30
EVCE: 112.06
BVCS: 0+341.15
BVCE: 116.68
EVCS: 0+347.61
EVCE: 117.42
BVCS: 0+372.55
BVCE: 119.38
EVCS: 0+388.25
EVCE: 118.86
BVCS: 0+411.66
BVCE: 115.47
EVCS: 0+430.51
EVCE: 114.71
EST = 0+450.39
ELEV = 116.000
-12.00%
-15.41%
-0.72%
13.90%
14.99%
7.86%
-14.56%
6.48%
3 CULVERT OF 24.00m
Ø 1.50 m
1 CULVERT OF 16.00m
Ø 0.60 m
170
160
150
140
130
120
110
100
90
80
106.41 106.182
104.63 103.777
101.84 101.265
99.68 98.608
98.12 95.805
90.79 92.858
88.90 91.105
90.02 90.962
90.05 91.515
94.76 93.687
103.77 96.467
113.22 99.246
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123.35 116.512
121.37 118.396
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113.97 114.645
118.07 115.326
0+000
0+020
0+040
0+060
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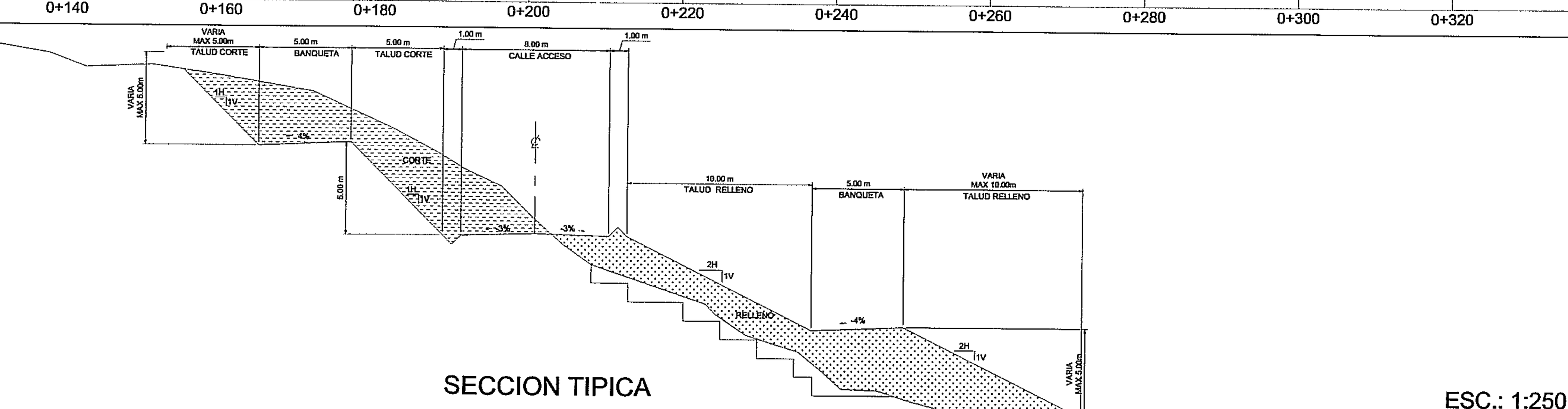

SECCION TIPICA

ESC.: 1:250

FRICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88-006-20
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

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2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS	DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
						ISSUED FOR INFORMATION							

REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

FIRST QUANTUM MINERALS LTD.

CLIENT: MPSA

PROJECT: MINA DE COBRE PANAMA

RELLENO SANITARIO

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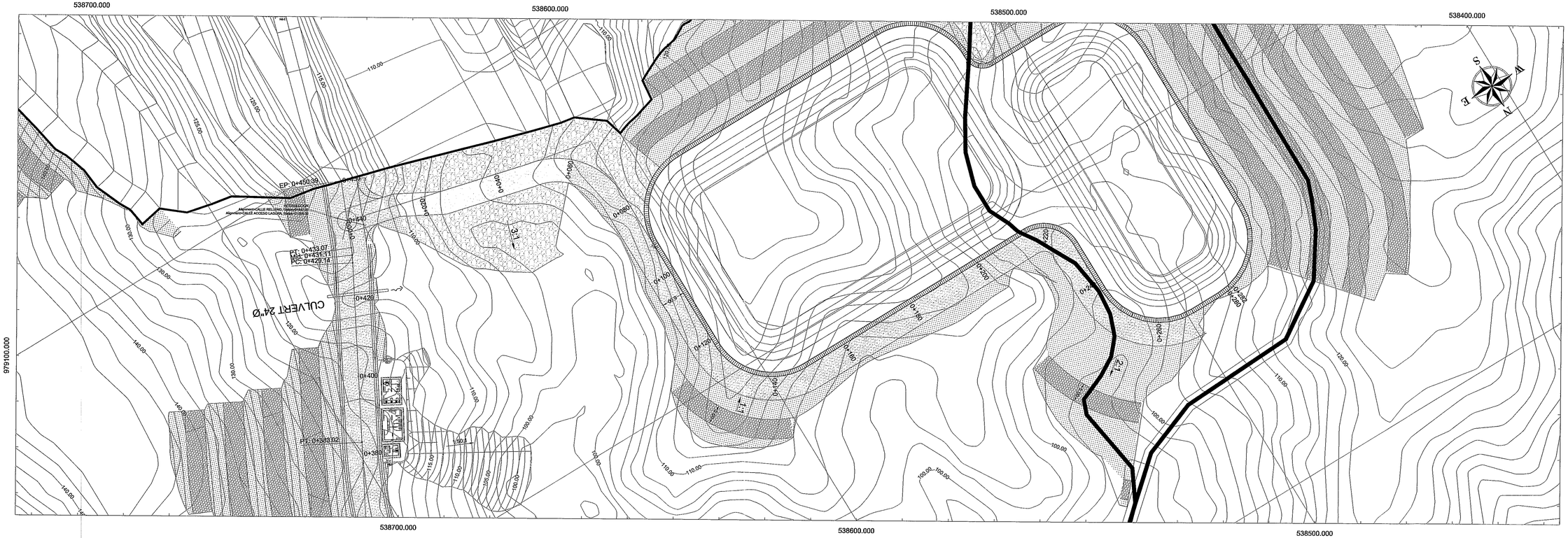
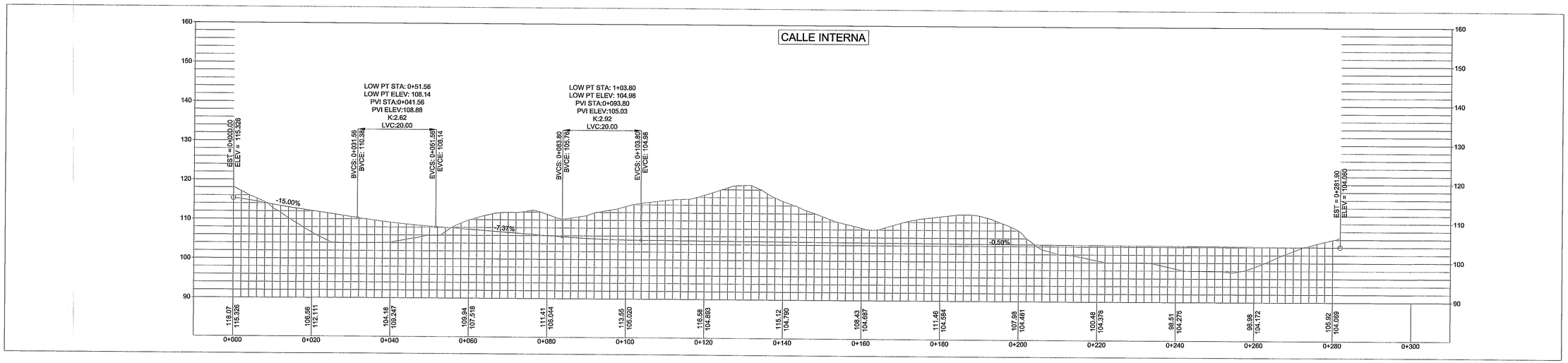
DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

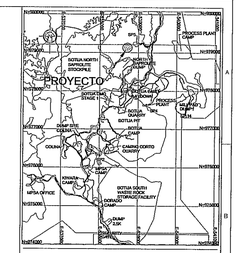
DRAWING TITLE: PLANTA PERFIL CALLE DE ACCESO

SCALE	JOB No.	DRG No.	REV.
1:600		1824-827-CI-8005	00

DRAWN | DATE







LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CURVAS MAYORES
- CURVAS MENORES
- CENTRO DE CARRETERA
- RODADURA
- BANQUETA
- HIDROGRAFIA
- TALUD
- PRESA / TALUD ENROCADO
- EMBALSE
- RASANTE
- TERRENO NATURAL

ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 85,0[illegible]-10
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS	DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
						ISSUED FOR INFORMATION							

REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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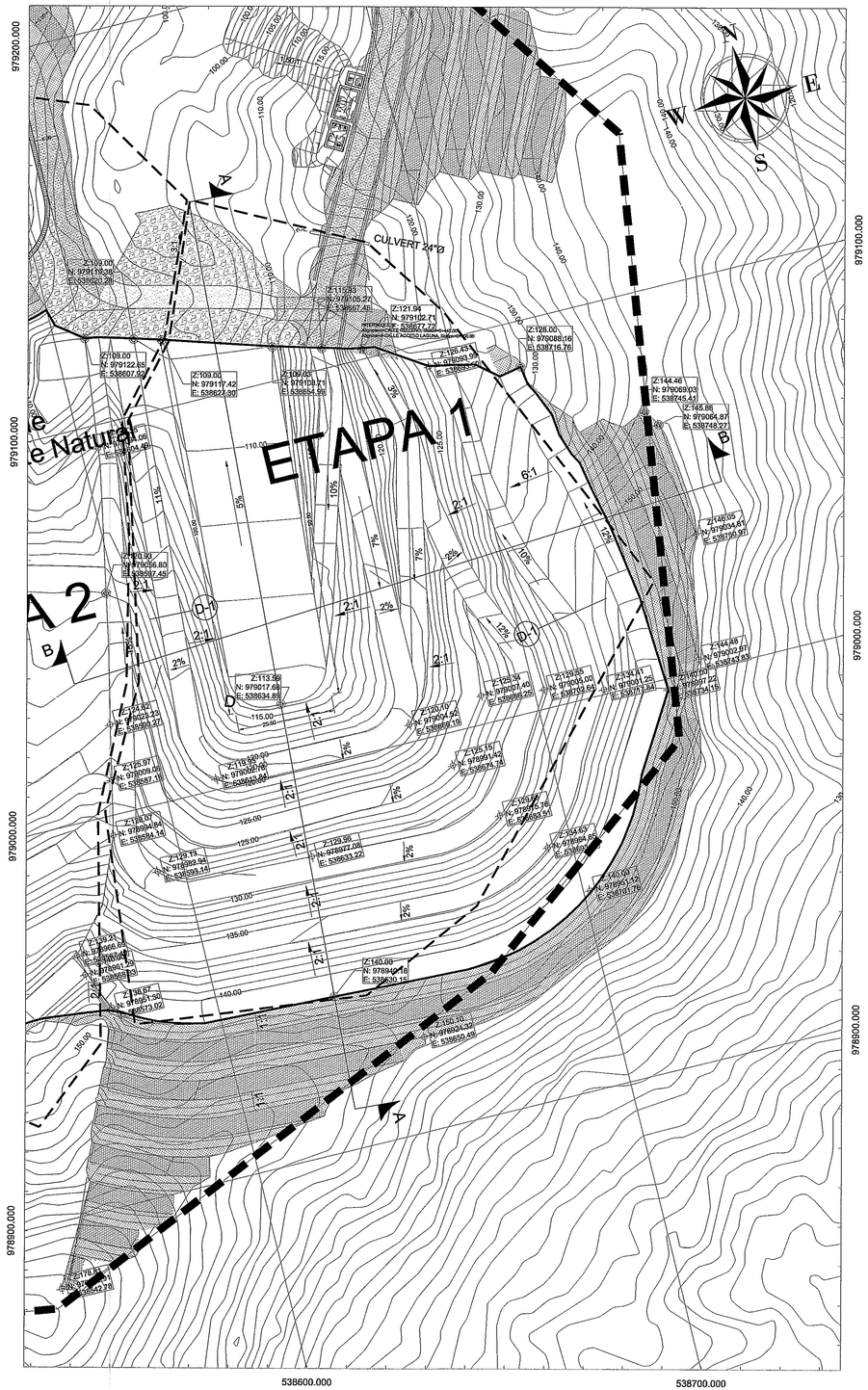
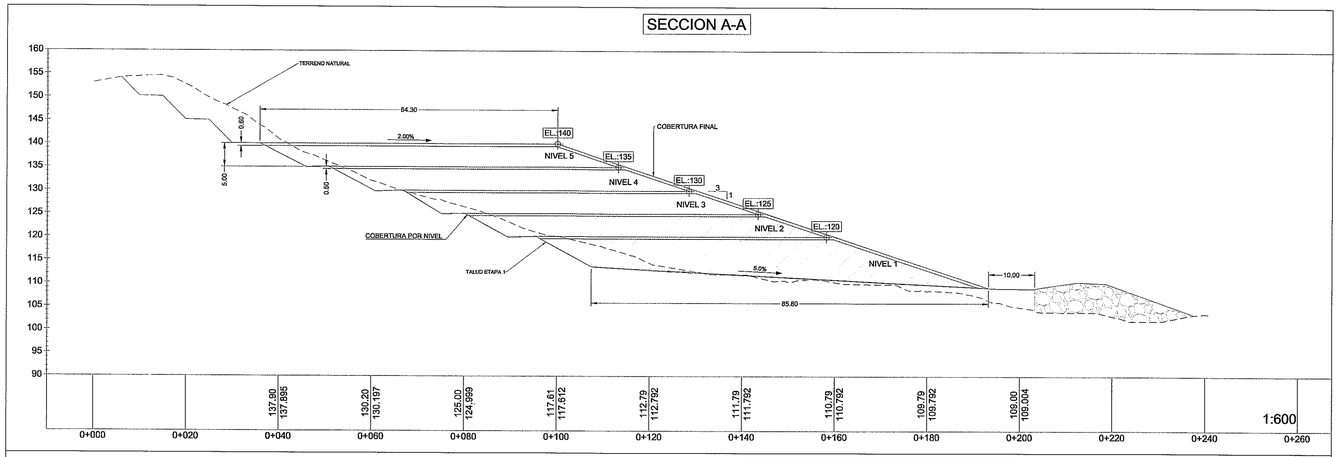
DRAWING TITLE: PLANTA PERFIL CALLE INTERNA

SCALE	JOB No.	DRG No.	REV.
1:500		1824-827-CI-8006	00

DRAWN | DATE



SECCION A-A



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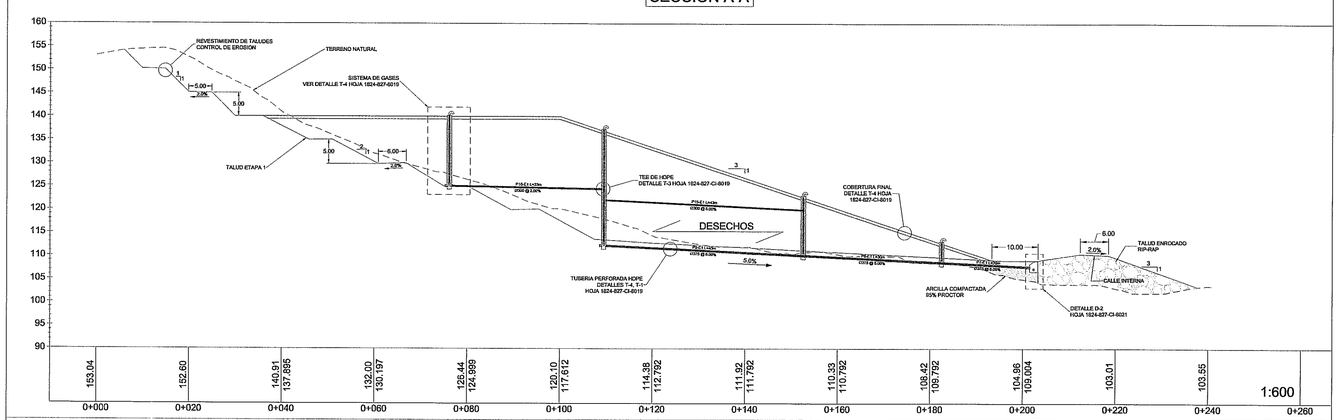

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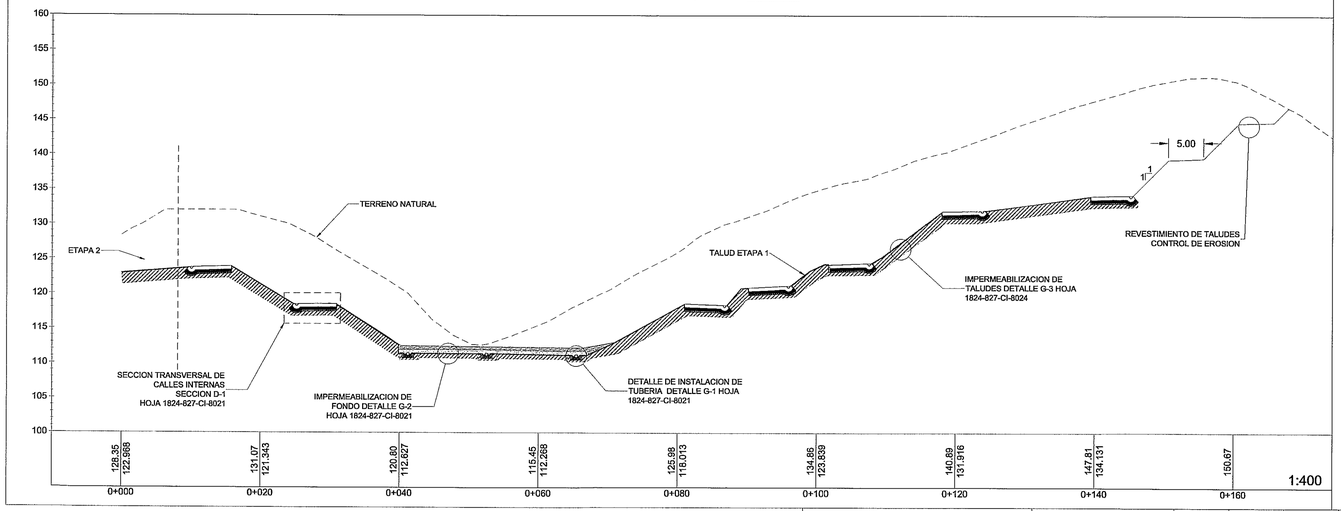
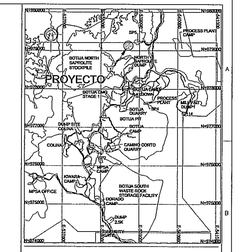
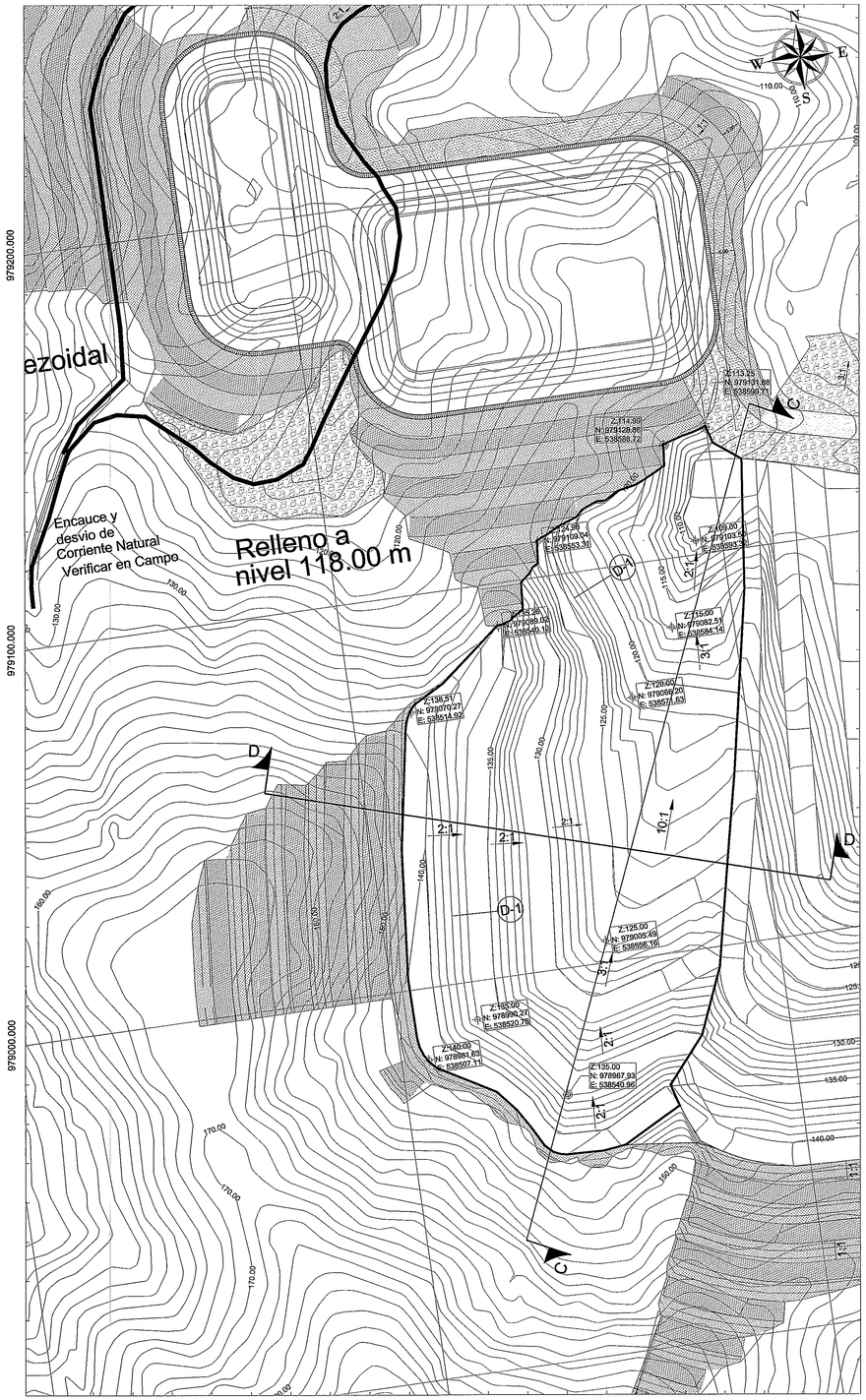



PROYECTO
MOTA NORTH
SAFFOLD
ETHOPILE
MOTA
MOTA
MOTA



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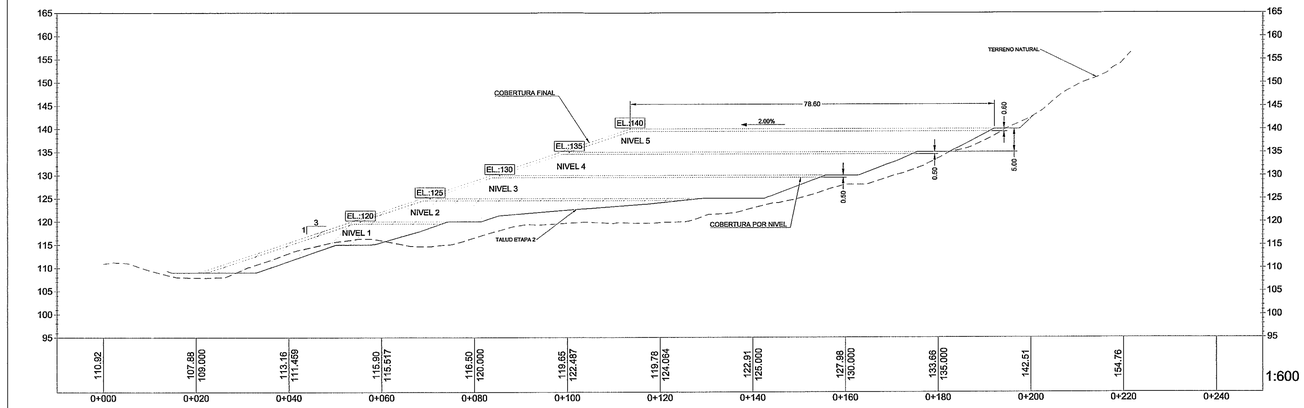

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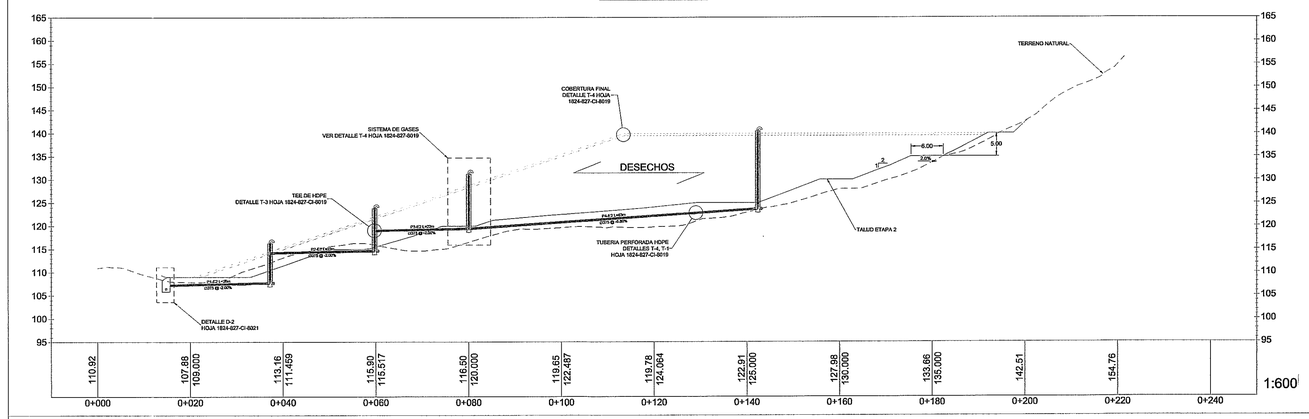
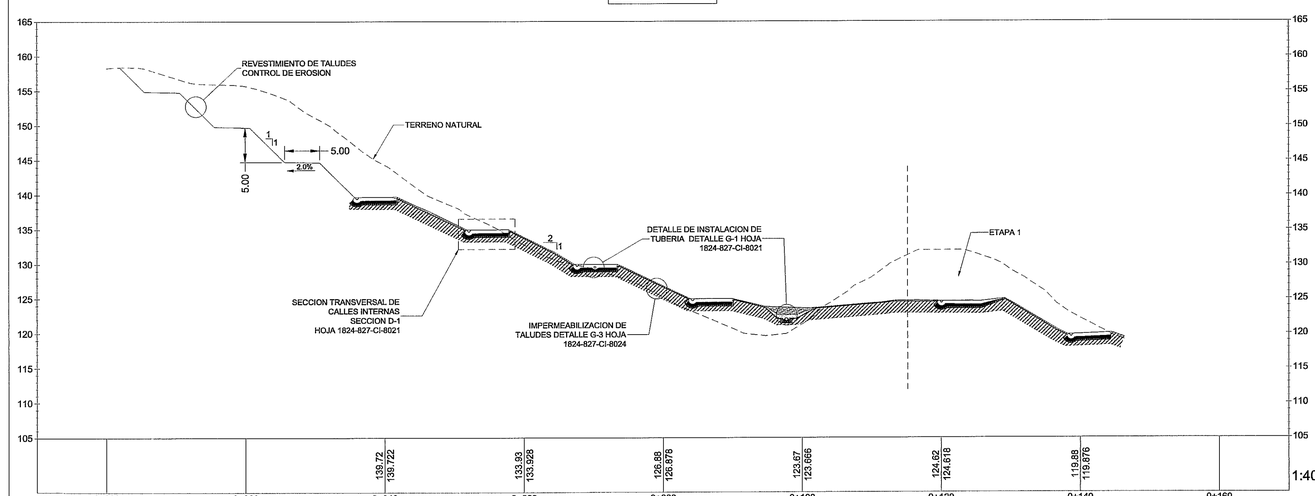
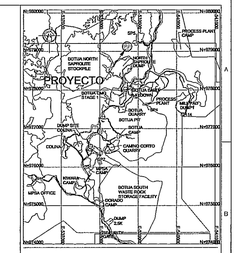


SECCION D-D





LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CURVAS MAYORES
- CALLES INTERNAS
- HIDROGRAFIA
- LIMITE DE LA ETAPA
- CURVAS MAYORES
- CURVAS MAYORES
- FASE 1
- FASE 2
- TALUD ENROCADO

ERICK M. VALLESTER E.
INGENIERO CIVIL
Lic. No. 85-0-9-20
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
		ISSUED FOR INFORMATION							

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT MPSA
PROJECT MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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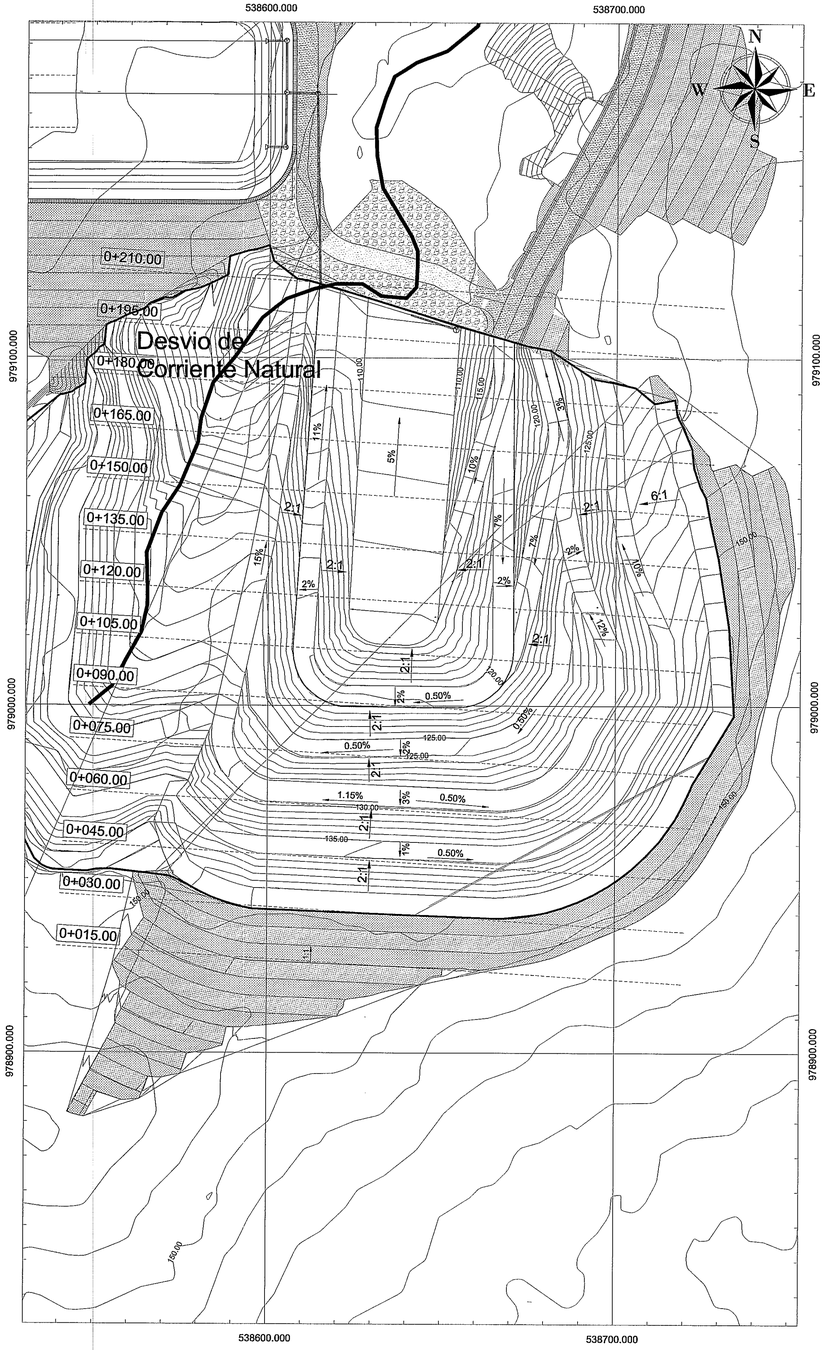
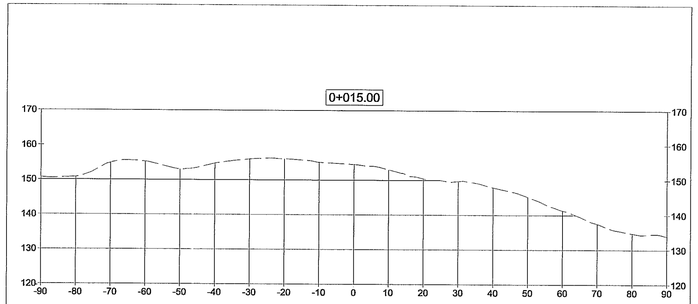
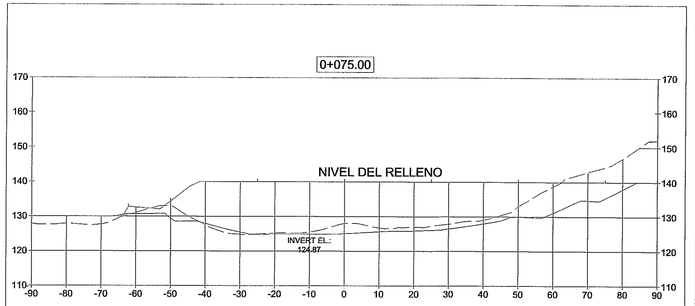
DRAWING TITLE
VISTA ETAPA 2, RELLENO

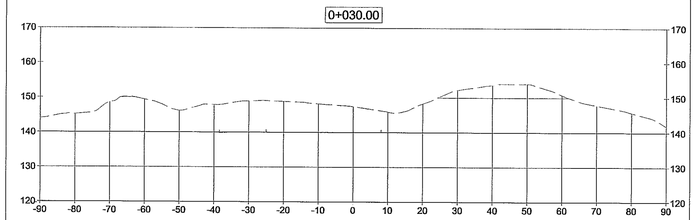
SCALE	JOB No.	DRG No.	REV.
1:700		1824-827-CI-8008	00

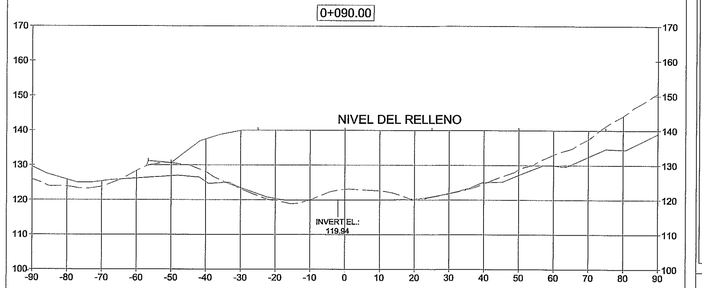
DRAWN	DATE

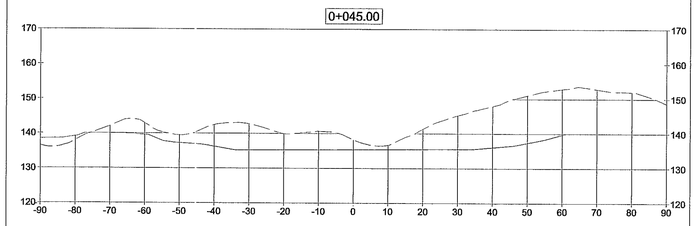


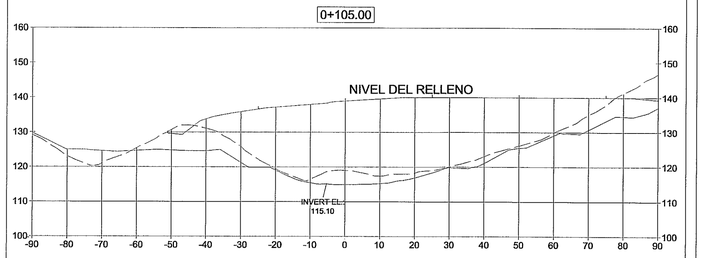


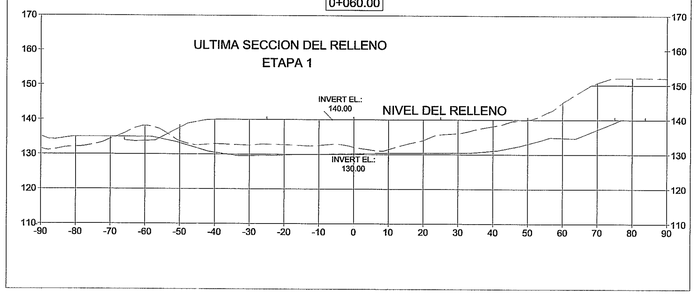


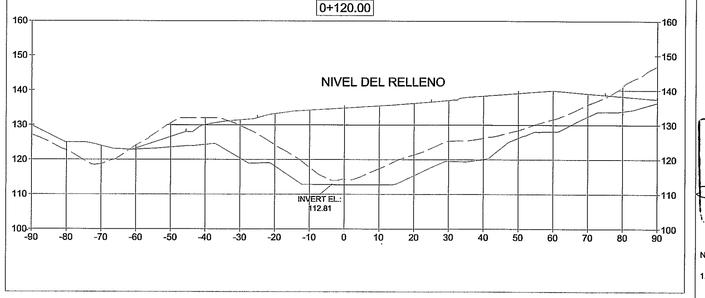


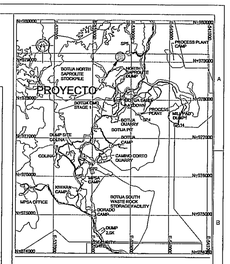






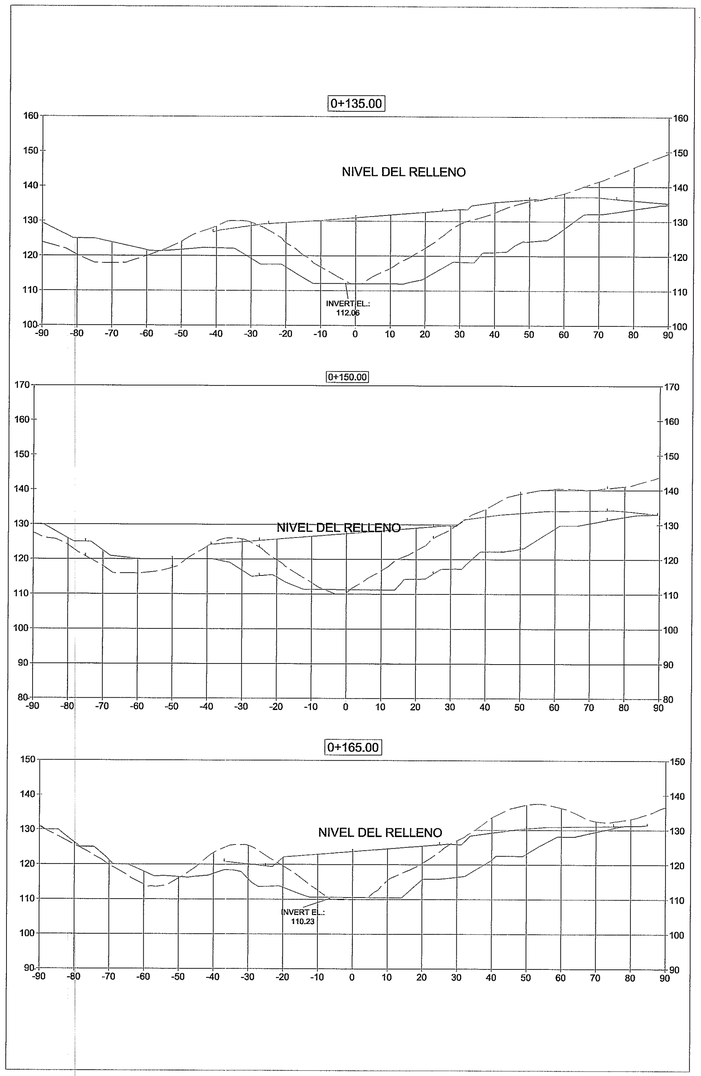


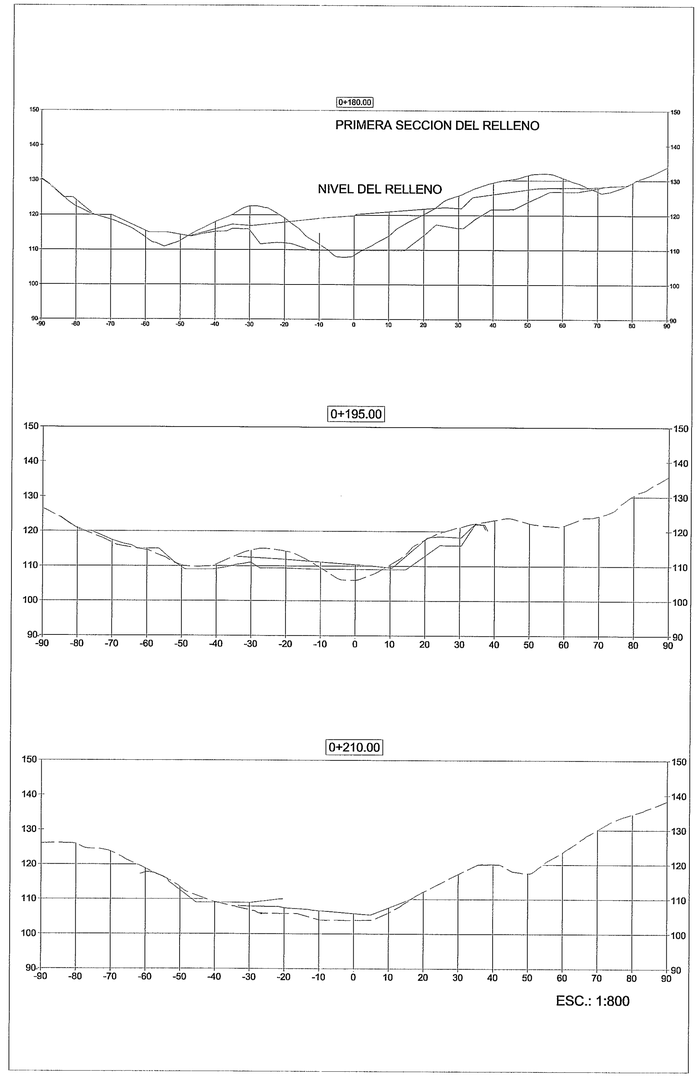



PROYECTO
PROCESS PLANT CAMP
SOTUA NORTH DAYBOOK & HOSPITAL
SOTUA NORTH
SOTUA SOUTH
SOTUA PIT
SOTUA CAMP
DUMP SITE SOTUA FILL
DUMP SITE SOTUA FILL
QUEBRADA CORTO
SOTUA SOUTH WASTE ROCK DUMP/FACILITY
SOTUA CAMP
DUMP SITE
MPSA OFFICE
KINROSS CAMP
SOTUA CAMP
DUMP SITE
SOTUA PIT
SOTUA
QUEBRADA CORTO
SOTUA SOUTH
SOTUA SOUTH WASTE ROCK DUMP/FACILITY
SOTUA CAMP
DUMP SITE
SOTUA PIT
SOTUA
QUEBRADA CORTO

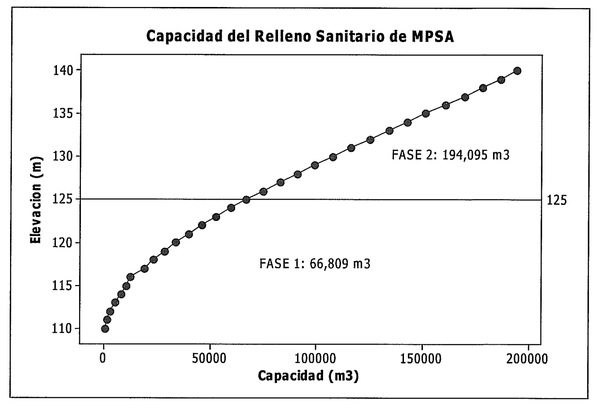
CAPACIDAD DEL RELLENO PARA LA ETAPA 1

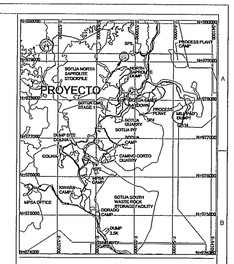
Capacidad del Relleno Sanitario MPSA	
Elevacion	Volumen
110.00	382.46
111.00	1,416.14
112.00	3,032.86
113.00	5,297.24
114.00	8,180.10
115.00	10,314.00
116.00	12,406.00
117.00	18,928.91
118.00	23,409.64
119.00	28,294.81
120.00	33,590.69
121.00	39,644.07
122.00	45,977.35
123.00	52,690.79
124.00	59,643.32
125.00	66,808.79
126.00	74,677.89
127.00	82,656.99
128.00	90,723.02
129.00	98,838.69
130.00	107,188.50
131.00	116,115.43
132.00	124,944.89
133.00	133,683.98
134.00	142,342.58
135.00	151,089.53
136.00	160,337.59
137.00	169,347.20
138.00	178,050.27
139.00	186,357.99
140.00	194,094.56





ESC.: 1:800





LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- TERRENO NATURAL
- TERRENO ADECUADO
- TUBERIA HDPE Ø450mm PERFORADA
- DIAGRAMA DE MASAS
- HIDROGRAFIA
- CURVAS MAYORES
- CURVAS MENORES

FRICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88 07 20
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 2.00m

ISSUED FOR INFORMATION																					
DRN	CHKD	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D	REV	DATE	DESCRIPTION	DRN	CHKD	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D	DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

ORG No	REFERENCE DRAWINGS	ORG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION

Minera Panamá

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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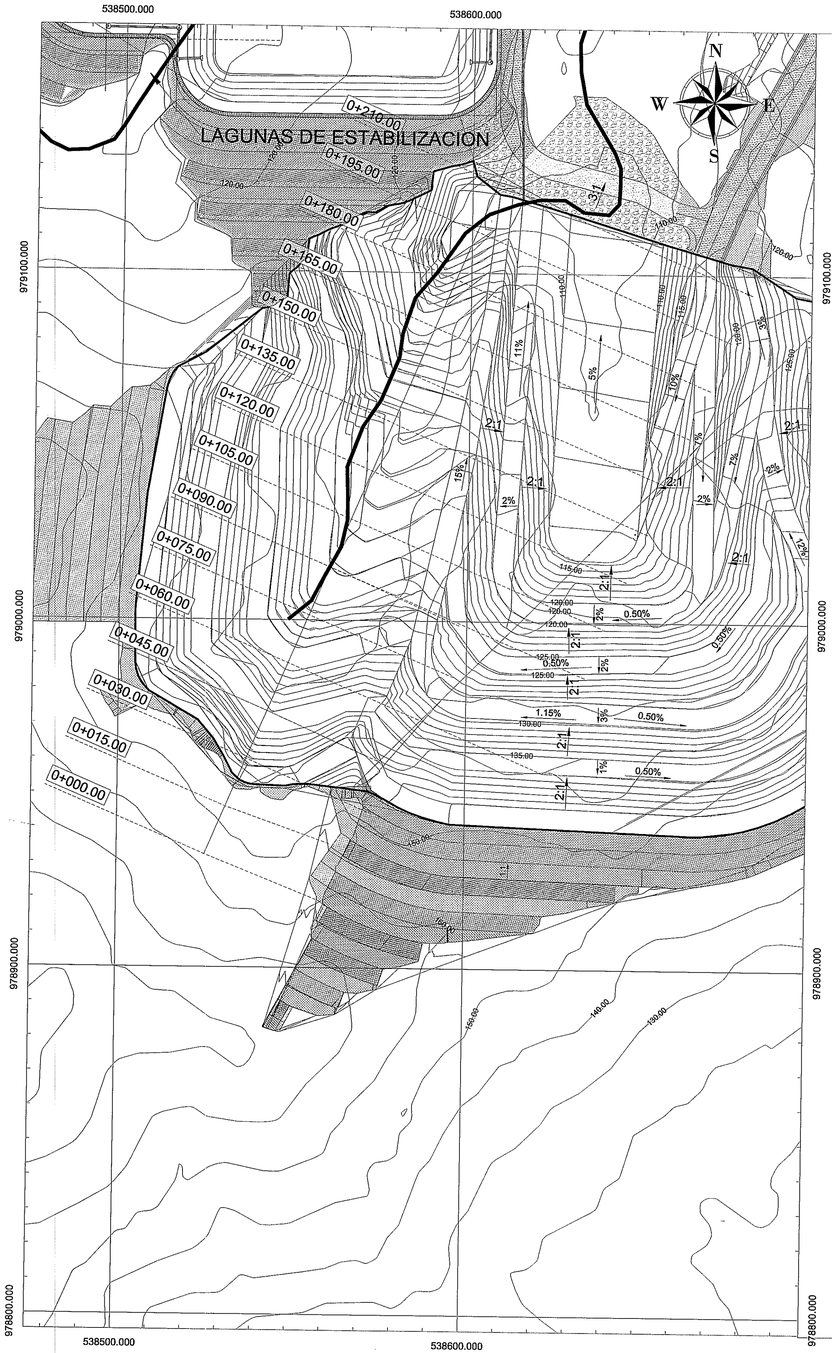
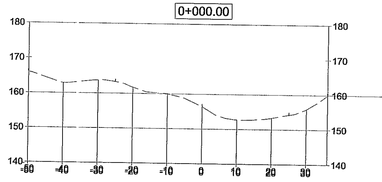
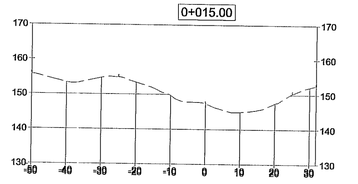
DRAWING TITLE: SECCIONES TRANSVERSALES ETAPA 1- CAPACIDAD

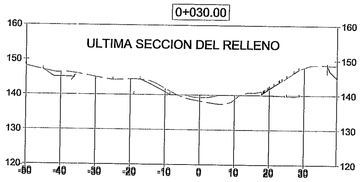
SCALE: 1:800 | JOB No. | ORG No.: 1824-827-CI-8010 | REV.: 00

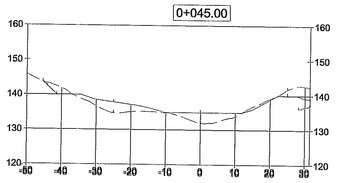
DRAWN | DATE

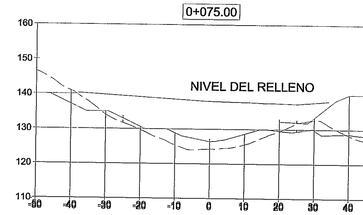


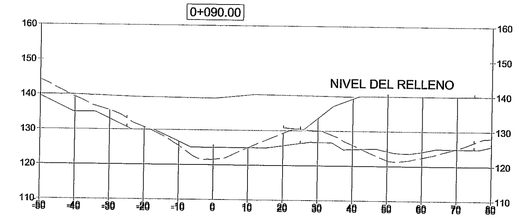


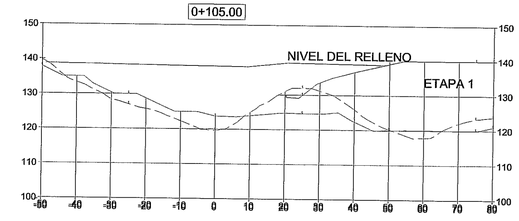


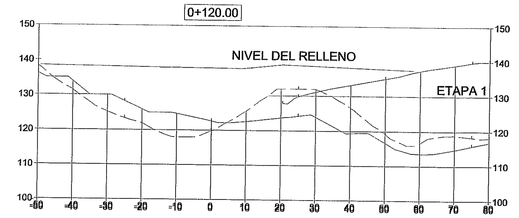


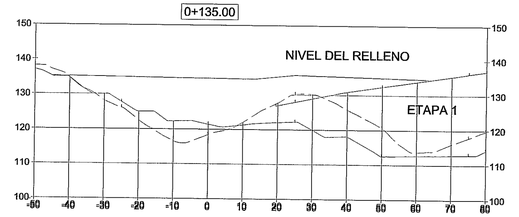


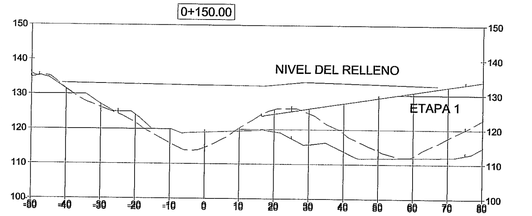


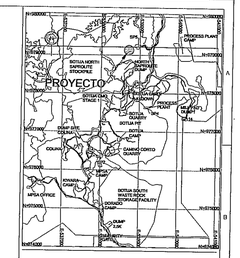












LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- RODADURA
- BANQUETA
- TALUD
- CURVAS MAYORES
- CURVAS MAYORES
- TERRENO NATURAL
- TERRENO ADECUADO
- SECCION TRANSVERSAL

ERICK N VALLESTER E.
INGENIERO CIVIL
Lic. No. 88 0 [illegible]
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS

DRG No	REFERENCE DRAWINGS

REV	DATE	DESCRIPTION
		ISSUED FOR INFORMATION

DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

REV	DATE	DESCRIPTION

DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

CLIENT MPSA

PROJECT MINA DE COBRE PANAMA

FIRST QUANTUM MINERALS LTD.

RELLENO SANITARIO

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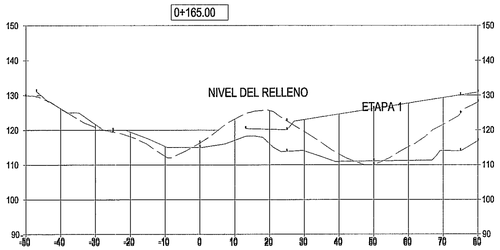
DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

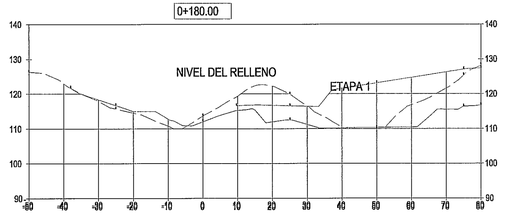
DRAWING TITLE

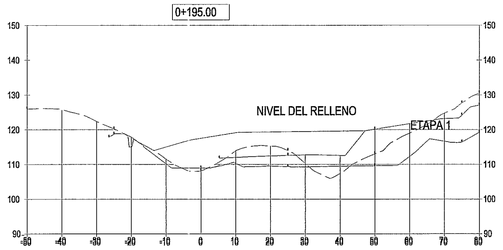
SECCIONES TRANSVERSALES ETAPA 2

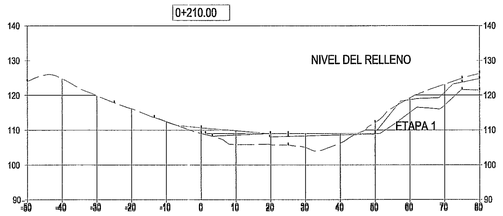
SCALE	JOB No.	DRG No.	REV.
1:800		1824-827-CI-8011	00

DRAWN | DATE





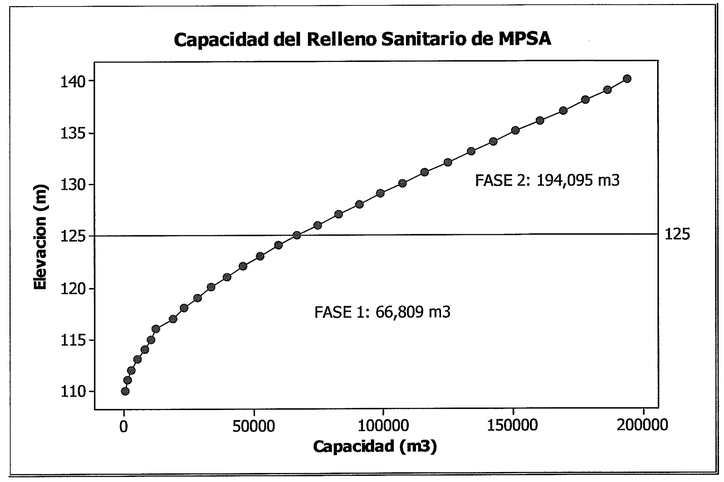


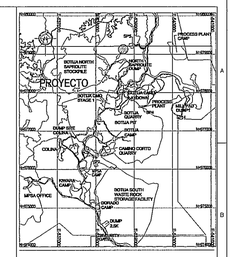


ESC.: 1:800

CAPACIDAD DEL RELLENO PARA LA ETAPA II

Capacidad del Relleno Sanitario MPSA	
Elevacion	Volumen
110.00	382.46
111.00	1,416.14
112.00	3,032.86
113.00	5,297.24
114.00	8,180.10
115.00	10,314.00
116.00	12,406.00
117.00	18,928.91
118.00	23,409.64
119.00	28,294.81
120.00	33,590.69
121.00	39,644.07
122.00	45,977.35
123.00	52,690.79
124.00	59,643.32
125.00	66,808.79
126.00	74,677.89
127.00	82,656.99
128.00	90,723.02
129.00	98,838.69
130.00	107,188.50
131.00	116,115.43
132.00	124,944.89
133.00	133,683.98
134.00	142,342.58
135.00	151,089.53
136.00	160,337.59
137.00	169,347.20
138.00	178,050.27
139.00	186,357.99
140.00	194,094.56





LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- TERRENO NATURAL
- TERRENO ADECUADO
- TUBERIA HDPE Ø450mm PERFORADA
- DIAGRAMA DE MASAS
- HIDROGRAFIA
- CURVAS MAYORES
- CURVAS MENORES

ERICK N. VALLESTER E
INGENIERO CIVIL
Lic. No. 88
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHKD	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
				ISSUED FOR INFORMATION							

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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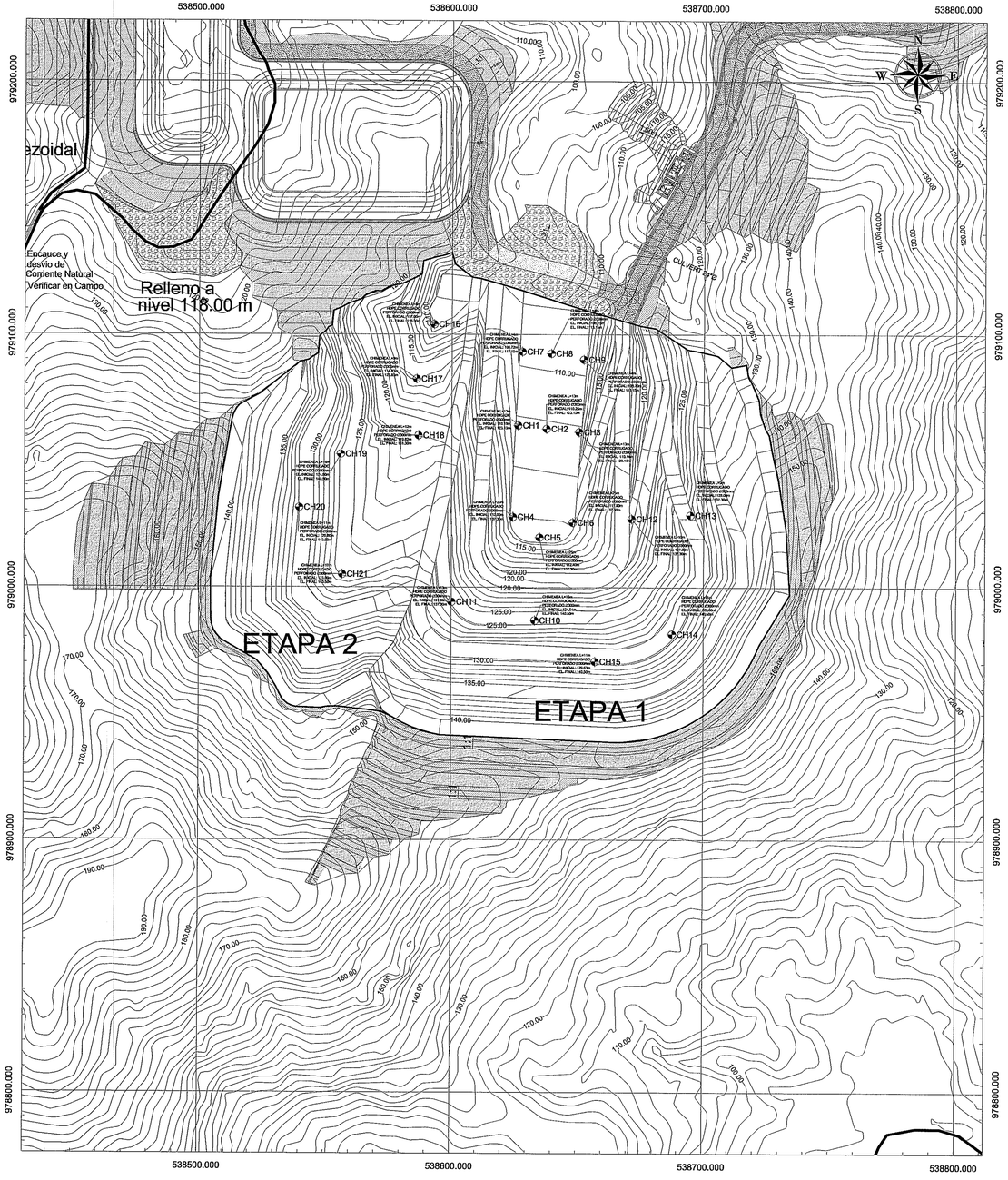
DRAWING TITLE: SECCIONES TRANSVERSALES ETAPA II - CAPACIDAD

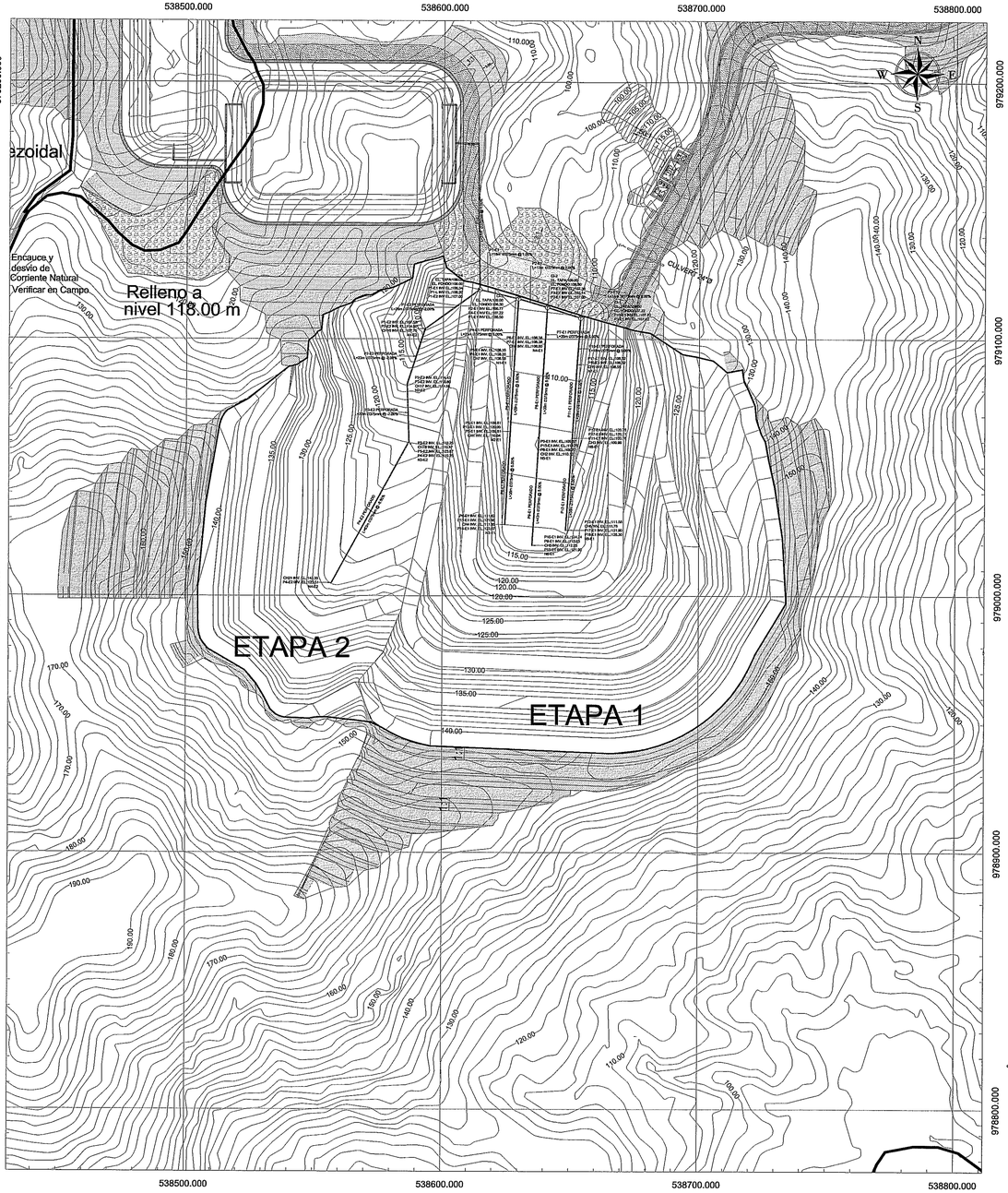
SCALE	JOB No.	DRG No.	REV.
1:800		1824-827-CI-8012	00

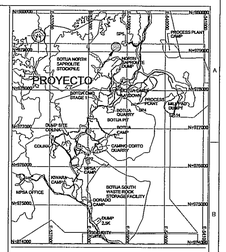
DRAWN | DATE

GASES



LIXIVIADOS





LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CHIMENEAS
- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- AREA DEL PROYECTO
- PRESA / TALUD ENROCADO
- EMBALSE
- BANQUETA
- TALUD
- LIMITE DE RELLENO
- TUBERIAS HDPE

FRICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88 07 20
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

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2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS

DRG No	REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
		ISSUED FOR INFORMATION							

REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT MPSA

PROJECT MINA DE COBRE PANAMA

RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

DRAWING TITLE
SISTEMA DE RECOLECCION DE GASES Y LIXIVIADOS

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SCALE 1:1000

JOB No.

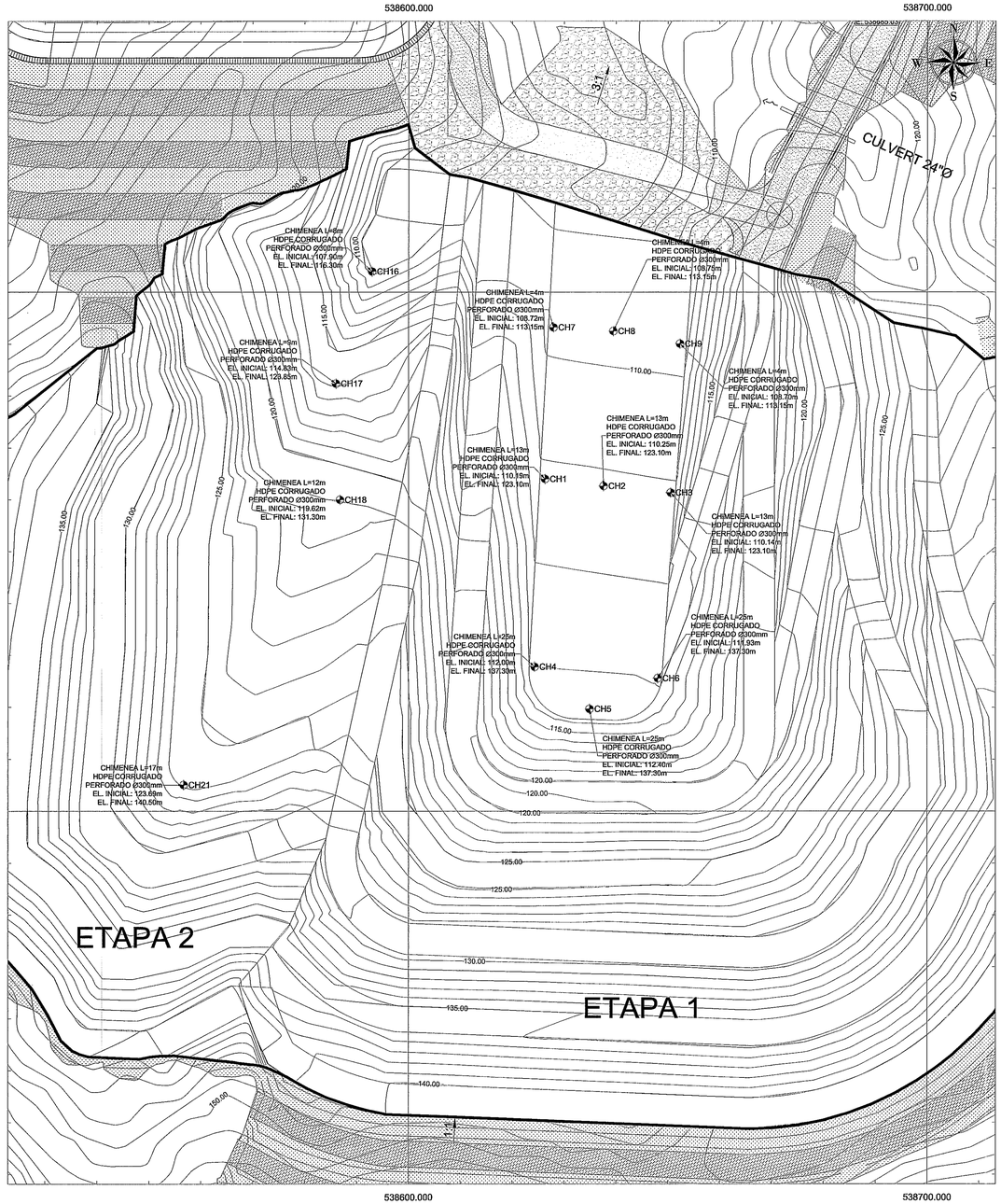
DRG No. 1824-827-CI-8013

REV. 00

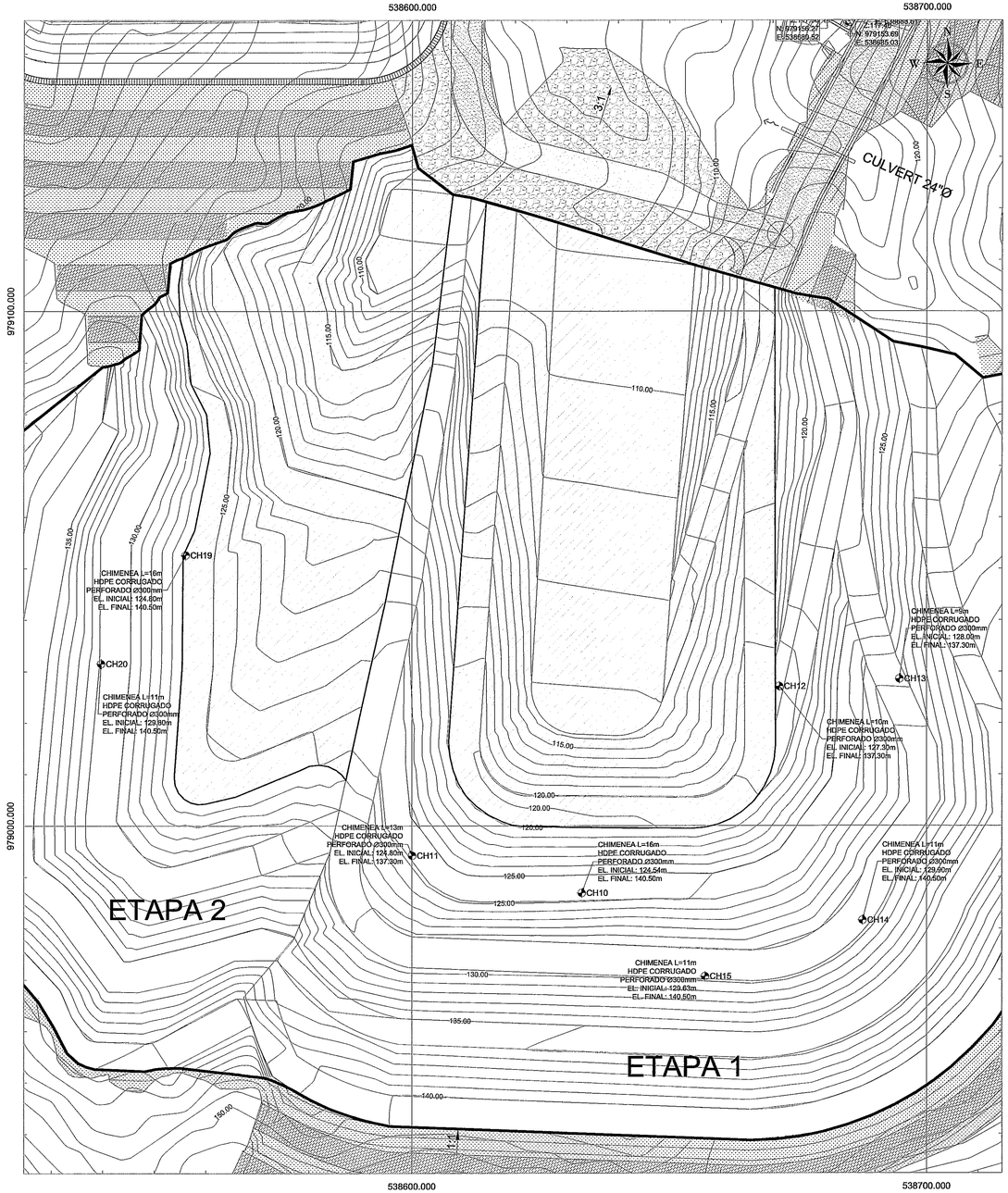
DRAWN

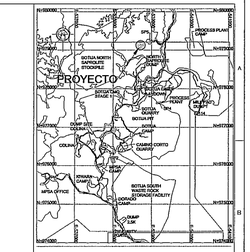
DATE

FASE 1



FASE 2





LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CHIMENEAS
- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- BANQUETA
- TALUD
- LIMITE DE RELLENO

COORDENADAS DE CHIMENEAS

CHIMENEA	ELEVACION	NORTE	ESTE
CH1	110.19	979064.03	538626.32
CH2	110.25	979062.66	538637.60
CH3	110.14	979061.39	538650.55
CH4	112.00	979027.61	538624.32
CH5	112.40	979019.68	538634.92
CH6	111.93	979025.60	538648.05
CH7	108.72	979093.21	538627.54
CH8	108.75	979092.49	538639.46
CH9	108.70	979090.07	538652.35
CH10	124.54	978986.93	538633.04
CH11	124.80	978994.21	538600.07
CH12	127.30	979027.07	538671.39
CH13	128.00	979028.54	538694.72
CH14	129.90	978981.58	538687.57
CH15	129.63	978970.66	538656.58
CH16	107.90	979103.58	538692.96
CH17	114.83	979082.40	538686.62
CH18	119.62	979060.01	538656.80
CH19	124.80	979052.61	538656.10
CH20	129.80	979031.49	538639.70
CH21	123.69	979005.07	538656.73

ERICK N. VALLESTER E.
INGENIERO CIVIL
Le No. 85 0 h. Tm
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CH'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
				ISSUED FOR INFORMATION							

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
FIRST QUANTUM MINERALS LTD.
RELLENO SANITARIO

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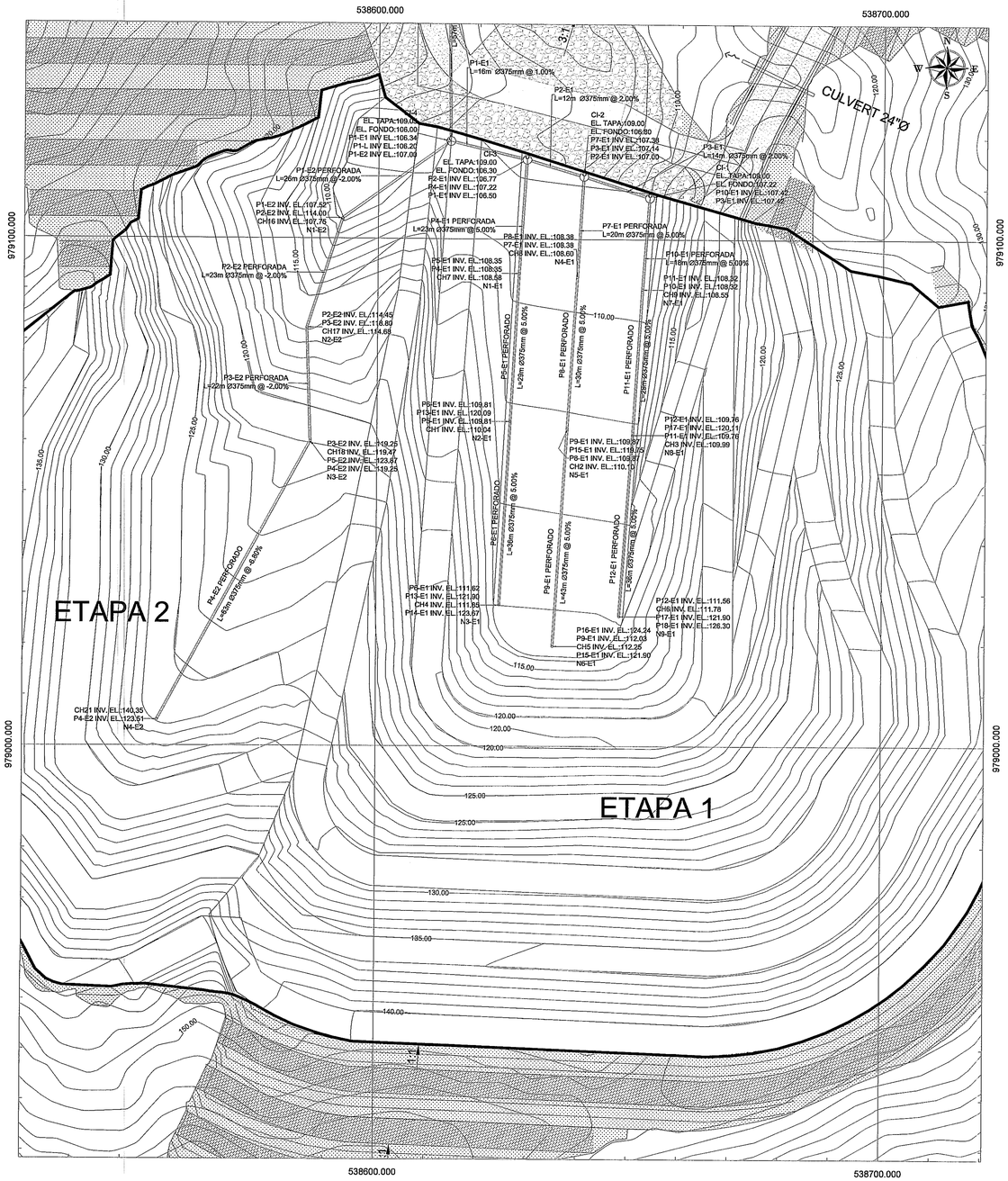
DRAWING TITLE: SISTEMA DE RECOLECCION DE GASES

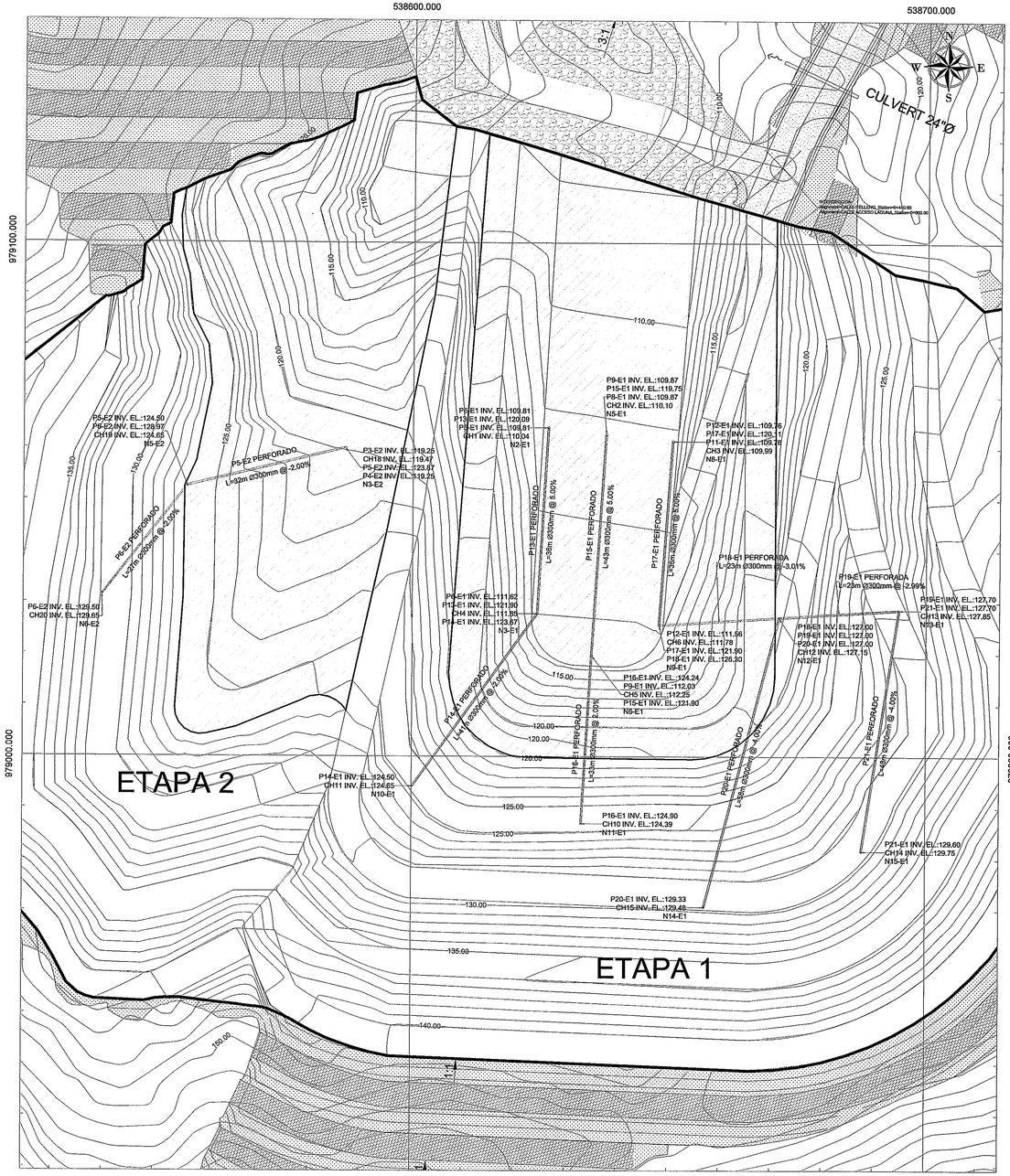
SCALE	JOB No.	DRG No.	REV.
1:500		1824-827-CI-8014	00

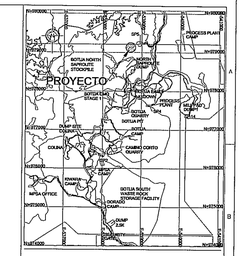
DRAWN | DATE

FASE 1



FASE 2





LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- TUBERIAS HDPE
- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- CURVAS MAYORES
- CURVAS MENORES
- CALLES INTERNAS
- BANQUETA
- TALUD
- LIMITE DEL RELLENO

TABLA DE NODOS Y ESTRUCTURAS

NODO / ESTRUCTURA:	NORTE	ESTE
N4-E2	979005.07	539356.73
N15-E1	978991.58	539687.57
N6-E2	979031.49	538529.70
N14-E1	978970.66	539056.98
N5-E2	979052.61	538556.10
N13-E1	979023.54	538694.72
N12-E1	979027.07	539071.39
N9-E1	979033.60	538648.05
N11-E1	978986.93	539033.04
N6-E1	979019.58	539634.92
N10-E1	978994.21	539000.07
N3-E1	979027.81	539624.32
N3-E2	979060.01	539586.80
N8-E1	979061.39	539050.55
N2-E1	979064.05	539626.32
N5-E1	979062.66	539537.60
N2-E2	979082.40	539586.02
N1-E2	979103.98	538592.96
CI-4	979119.26	539614.25
CI-1	979106.20	539653.68
CI-3	979115.89	539629.35
CI-2	979112.37	539640.81
N4-E1	979092.49	539639.46
N1-E1	979095.21	539627.64
N7-E1	979090.07	539552.35

NOMENCLATURA:
1. N#: NODO (YEE / TEE)
2. E#: NUMERO DE ETAPA
3. CI: CAMARA DE INSPECCION

FRICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88-04-20
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:
1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.
2. CONTOURS 2.00m
3. ALL THE PIPES ARE OF HDPE CORRUGATED

DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
				ISSUED FOR INFORMATION							

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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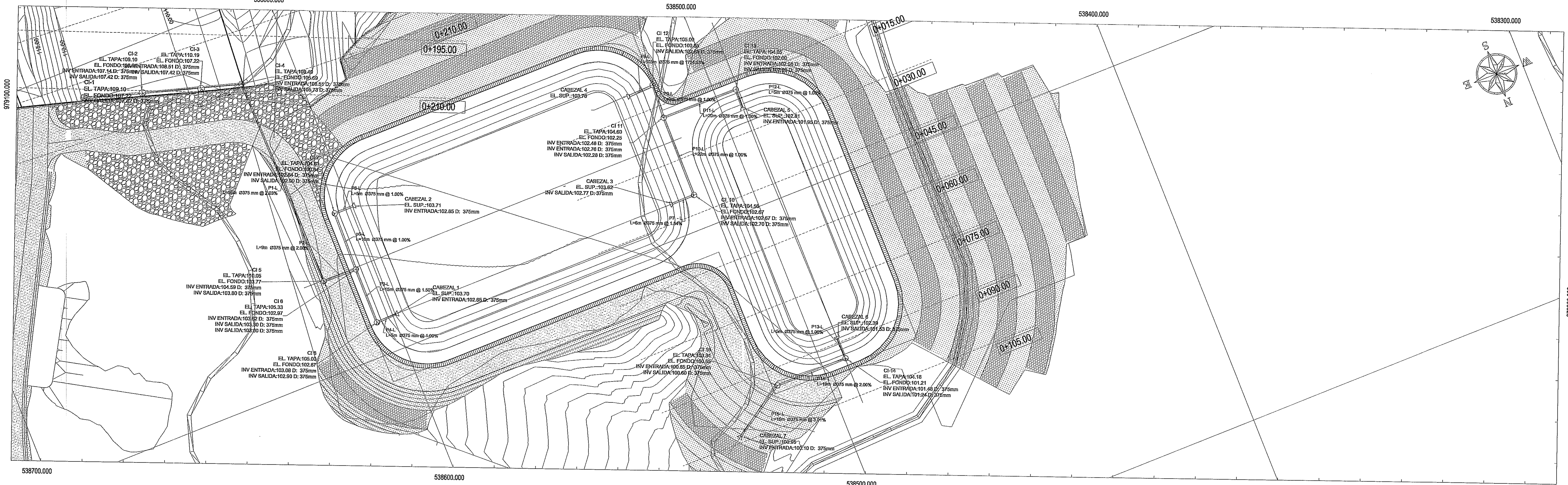
DRAWING TITLE: SISTEMA DE RECOLECCION DE LIXIVIADOS

SCALE	JOB No.	DRG No.	REV.
1:500		1824-827-CI-8015	00

DRAWN | DATE


538600.000
538500.000
538400.000
538300.000
538700.000
979100.000
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0+015.00
0+030.00
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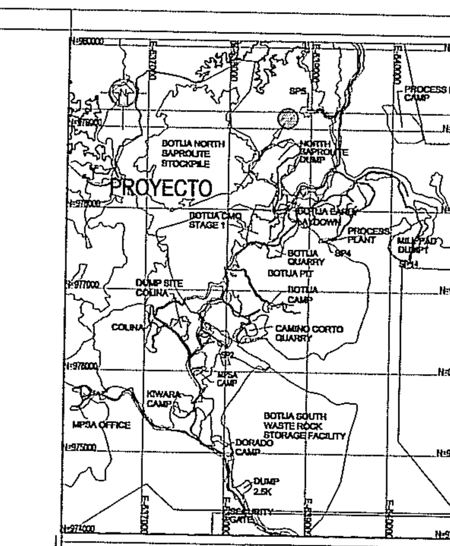
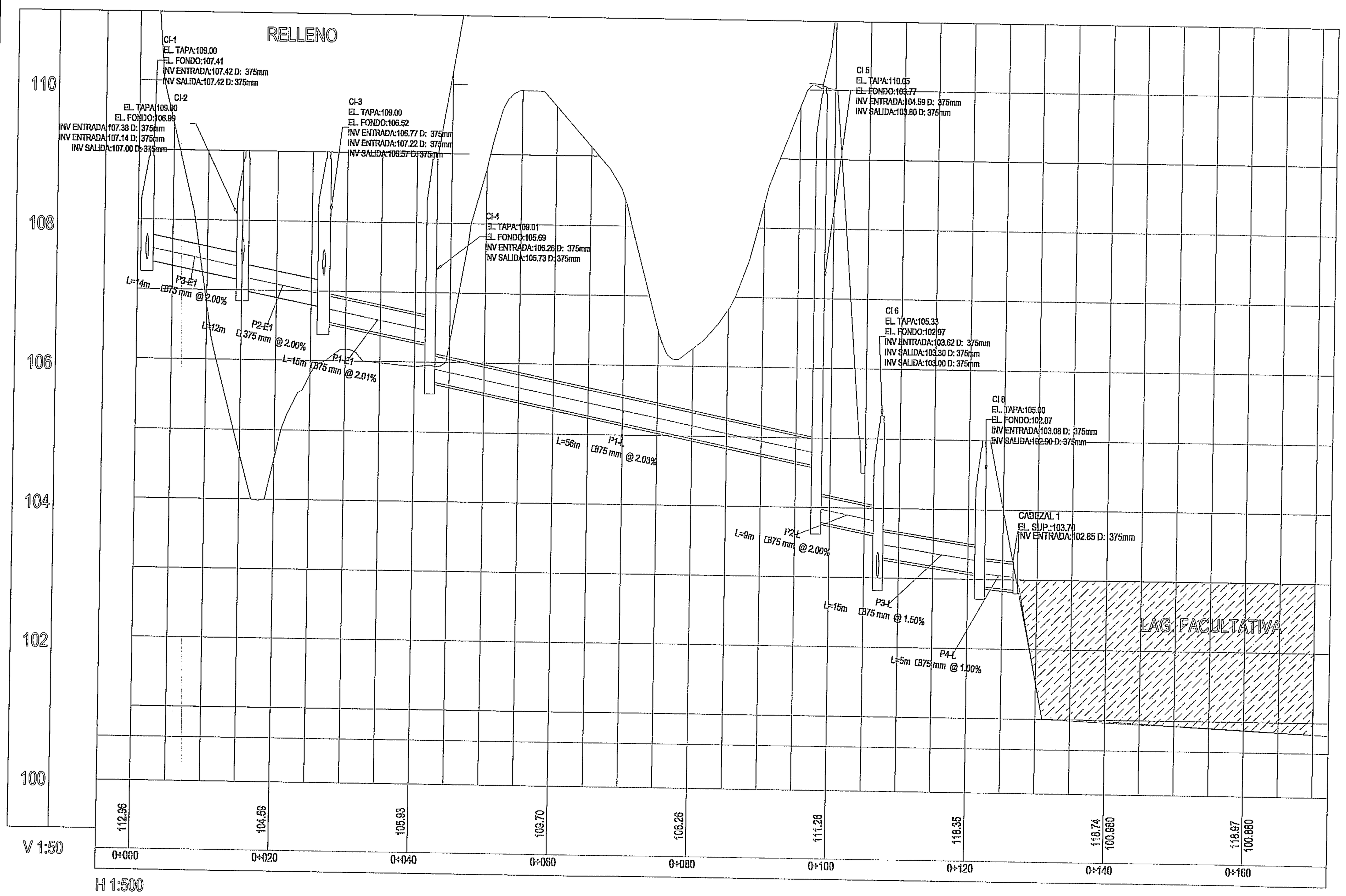
0+060.00
0+075.00
0+090.00
0+105.00
0+195.00
0+210.00
CI-1
EL. TAPA:109.10
EL. FONDO:107.22
INV SALIDA:107.42 D: 375mm
CI-2
EL. TAPA:109.10
INV ENTRADA:107.14 D: 375mm
INV SALIDA:107.42 D: 375mm
CI-3
EL. TAPA:110.19
EL. FONDO:107.22
INV ENTRADA:108.51 D: 375mm
INV SALIDA:107.42 D: 375mm
CI-4
EL. TAPA:109.45
EL. FONDO:105.69
INV ENTRADA:108.51 D: 375mm
INV SALIDA:105.73 D: 375mm
CI 5
EL. TAPA:110.05
EL. FONDO:103.77
INV ENTRADA:104.59 D: 375mm
INV SALIDA:103.80 D: 375mm
CI 6
EL. TAPA:105.33
EL. FONDO:102.97
INV ENTRADA:103.52 D: 375mm
INV SALIDA:103.30 D: 375mm
INV SALIDA:103.00 D: 375mm
CI 8
EL. TAPA:105.00
EL. FONDO:102.87
INV ENTRADA:103.08 D: 375mm
INV SALIDA:102.90 D: 375mm
P1-L
L=56m Ø375 mm @ 2.03%
L=9m Ø375 mm @ 2.00%
P3-L
L=15m Ø375 mm @ 1.50%
P4-L
L=5m Ø375 mm @ 1.00%
P5-L
L=16m Ø375 mm @ 1.00%
P6-L
L=5m Ø375 mm @ 1.00%
CABEZAL 1
EL. SUP.:103.70
INV ENTRADA:102.85 D: 375mm
CABEZAL 2
EL. SUP.:103.71
INV ENTRADA:102.85 D: 375mm
CABEZAL 3
EL. SUP.:103.62
INV SALIDA:102.77 D: 375mm
CABEZAL 4
EL. SUP.:103.76
CI 11
EL. TAPA:104.60
EL. FONDO:102.25
INV ENTRADA:102.48 D: 375mm
INV ENTRADA:102.76 D: 375mm
INV SALIDA:102.28 D: 375mm
CI 12
EL. TAPA:105.00
EL. FONDO:100.65
INV SALIDA:102.65 D: 375mm
CI 13
EL. TAPA:104.05
EL. FONDO:102.00
INV ENTRADA:102.08 D: 375mm
INV SALIDA:102.00 D: 375mm
CI 10
EL. TAPA:104.56
EL. FONDO:102.67
INV ENTRADA:102.67 D: 375mm
INV SALIDA:102.70 D: 375mm
P7 - L
L=6m Ø375 mm @ 1.54%
P8-L
P9-L
P10-L
L=22m Ø375 mm @ 1.00%
P11-L
L=20m Ø375 mm @ 1.00%
P12-L
L=5m Ø375 mm @ 1.00%
CABEZAL 5
EL. SUP.:102.81
INV ENTRADA:101.95 D: 375mm
CABEZAL 6
EL. SUP.:102.39
INV SALIDA:101.53 D: 375mm
P13-L
L=5m Ø375 mm @ 1.00%
CI 15
EL. TAPA:103.34
EL. FONDO:100.55
INV ENTRADA:100.85 D: 375mm
INV SALIDA:100.60 D: 375mm
CI-14
EL. TAPA:104.18
EL. FONDO:101.21
INV ENTRADA:101.48 D: 375mm
INV SALIDA:101.24 D: 375mm
L=19m Ø375 mm @ 2.00%
P15-L
L=16m Ø375 mm @ 3.01%
CABEZAL 7
EL. SUP.:100.96
INV ENTRADA:100.10 D: 375mm
S
W
E
N

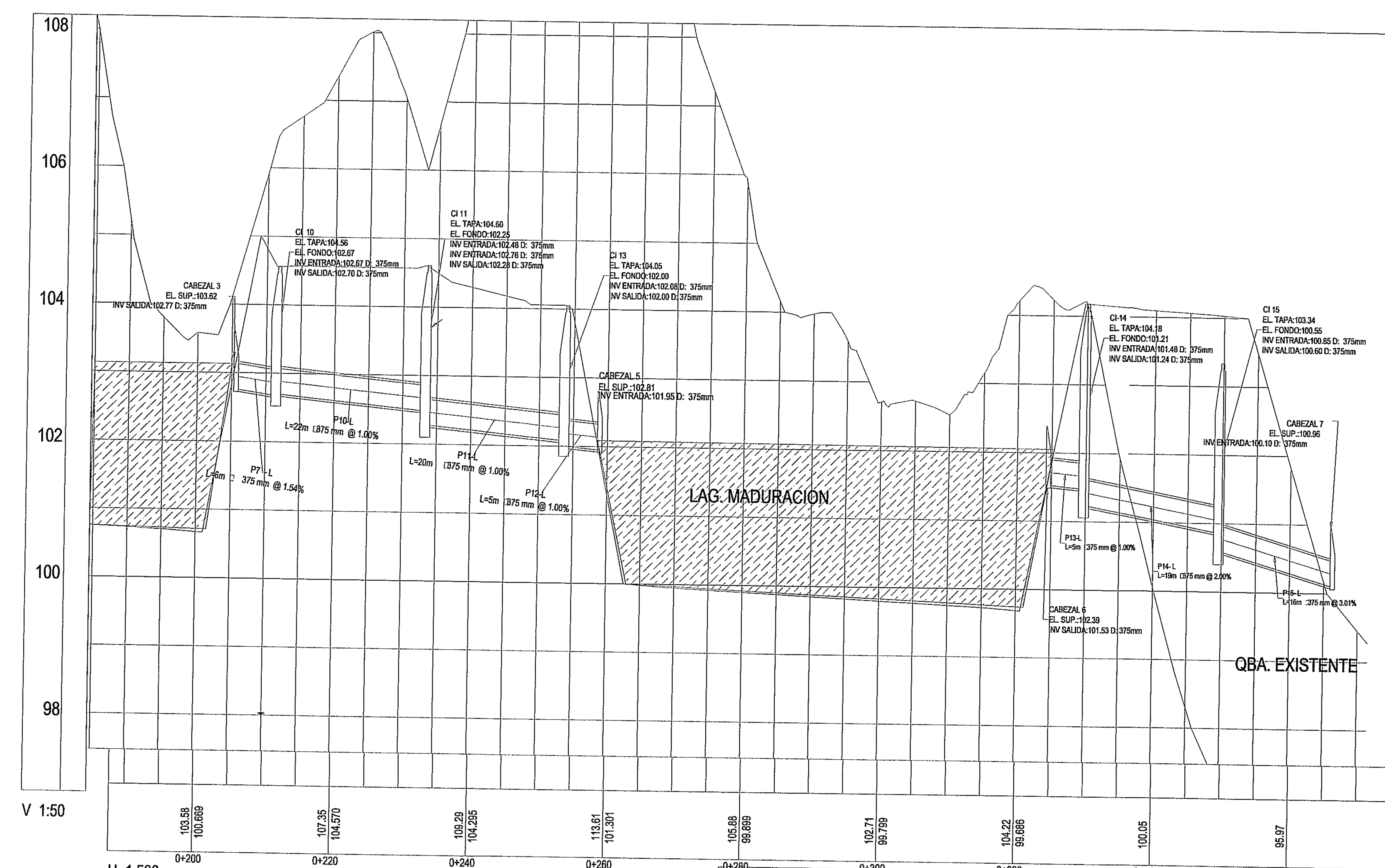

PROYECTO
PROCESS PLANT CAMP
BOTIJA NORTH SAPROLITE STOCKPILE
NORTH SAPROLITE DUMP
PROCESS PLANT
BOTIJA QUARRY
BOTIJA PIT
BOTIJA CAMP
DUMP SITE COLINA
COLINA
CAMINO CORTO QUARRY
KWARA CAMP
MPSA OFFICE
BOTIJA SOUTH WASTE ROCK STORAGE FACILITY
DORADO CAMP
DUMP 2.5K

LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- POZO
- CURVAS MAYORES
- CURVAS MENORES
- CENTRO DE CARRETERA
- RODADURA
- BANQUETA
- HIDROGRAFIA
- TALUD
- PRESA / TALUD ENROCADO
- EMBALSE
- RASANTE
- TERRENO NATURAL


RELLENO
110
108
106
104
102
100
CI-1
EL. TAPA:109.00
EL. FONDO:107.41
INV ENTRADA:107.42 D: 375mm
INV SALIDA:107.42 D: 375mm
CI-2
EL. TAPA:109.00
EL. FONDO:106.99
INV ENTRADA:107.38 D: 375mm
INV ENTRADA:107.14 D: 375mm
INV SALIDA:107.00 D: 375mm
CI-3
EL. TAPA:109.00
EL. FONDO:106.52
INV ENTRADA:106.77 D: 375mm
INV ENTRADA:107.22 D: 375mm
INV SALIDA:106.57 D: 375mm
CI-4
EL. TAPA:109.01
EL. FONDO:105.69
INV ENTRADA:106.26 D: 375mm
INV SALIDA:105.73 D: 375mm
CI 5
EL. TAPA:110.05
EL. FONDO:103.77
INV ENTRADA:104.59 D: 375mm
INV SALIDA:103.80 D: 375mm
CI 6
EL. TAPA:105.33
EL. FONDO:102.97
INV ENTRADA:103.62 D: 375mm
INV SALIDA:103.30 D: 375mm
INV SALIDA:103.00 D: 375mm
CI 8
EL. TAPA:105.00
EL. FONDO:102.87
INV ENTRADA:103.08 D: 375mm
INV SALIDA:102.90 D: 375mm
CABEZAL 1
EL. SUP.:103.70
INV ENTRADA:102.85 D: 375mm
P3-E1
L=14m Ø375 mm @ 2.00%
P2-E1
L=12m Ø375 mm @ 2.00%
P1-E1
L=15m Ø375 mm @ 2.01%
P1-L
L=56m Ø375 mm @ 2.03%
P2-L
L=9m Ø375 mm @ 2.00%
P3-L
L=15m Ø375 mm @ 1.50%
P4-L
L=5m Ø375 mm @ 1.00%
LAG. FACULTATIVA
112.96
104.59
105.93
109.70
106.26
111.26
118.35
118.74
100.980
118.97
100.860
0+000
0+020
0+040
0+060
0+080
0+100
0+120
0+140
0+160
V 1:50
H 1:500


108
106
104
102
100
98
CABEZAL 3
EL. SUP.:103.62
INV SALIDA:102.77 D: 375mm
CI 10
EL. TAPA:104.56
EL. FONDO:102.67
INV ENTRADA:102.67 D: 375mm
INV SALIDA:102.70 D: 375mm
CI 11
EL. TAPA:104.60
EL. FONDO:102.25
INV ENTRADA:102.48 D: 375mm
INV ENTRADA:102.76 D: 375mm
INV SALIDA:102.28 D: 375mm
CI 13
EL. TAPA:104.05
EL. FONDO:102.00
INV ENTRADA:102.08 D: 375mm
INV SALIDA:102.00 D: 375mm
CABEZAL 5
EL. SUP.:102.81
INV ENTRADA:101.95 D: 375mm
P7 - L
L=6m Ø375 mm @ 1.54%
P10-L
L=22m Ø375 mm @ 1.00%
P11-L
L=20m Ø375 mm @ 1.00%
P12-L
L=5m Ø375 mm @ 1.00%
LAG. MADURACION
CI-14
EL. TAPA:104.18
EL. FONDO:101.21
INV ENTRADA:101.48 D: 375mm
INV SALIDA:101.24 D: 375mm
CI 15
EL. TAPA:103.34
EL. FONDO:100.55
INV ENTRADA:100.85 D: 375mm
INV SALIDA:100.60 D: 375mm
CABEZAL 7
EL. SUP.:100.96
INV ENTRADA:100.10 D: 375mm
P13-L
L=5m Ø375 mm @ 1.00%
P14- L
L=19m Ø375 mm @ 2.00%
P15-L
L=16m Ø375 mm @ 3.01%
CABEZAL 6
EL. SUP.:102.39
INV SALIDA:101.53 D: 375mm
QBA. EXISTENTE
103.58
100.669
107.35
104.570
109.29
104.295
113.61
101.301
105.88
99.899
102.71
99.799
104.22
99.686
100.05
95.97
0+200
0+220
0+240
0+260
0+280
0+300
0+320
0+340
0+360
V 1:50
H 1:500

ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 880-6-20
FIRMA
LEY 15 DEL 26 DE ENERO DE 19..
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

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DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA

PROJECT: MINA DE COBRE PANAMA

RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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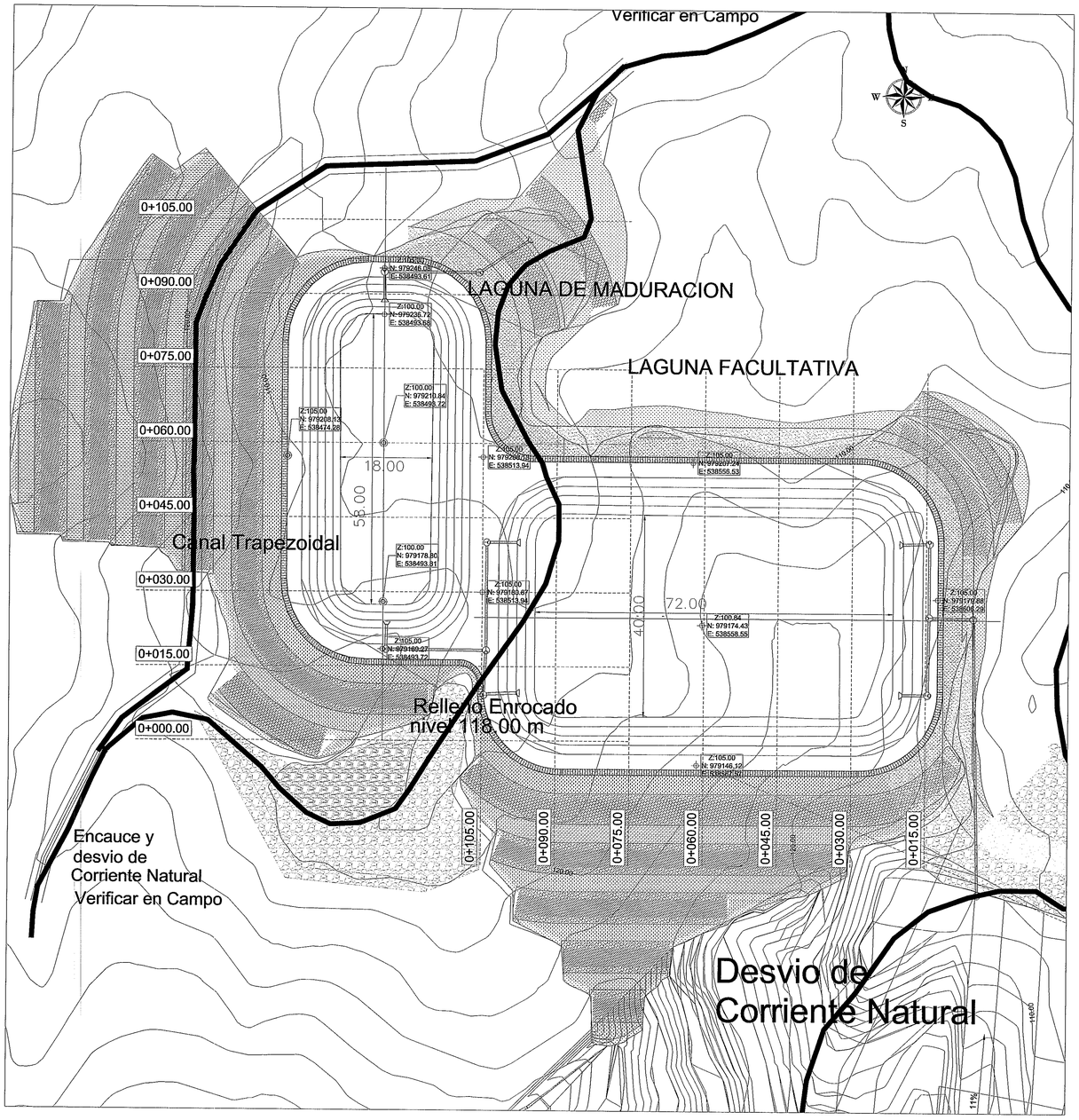
DRAWING TITLE

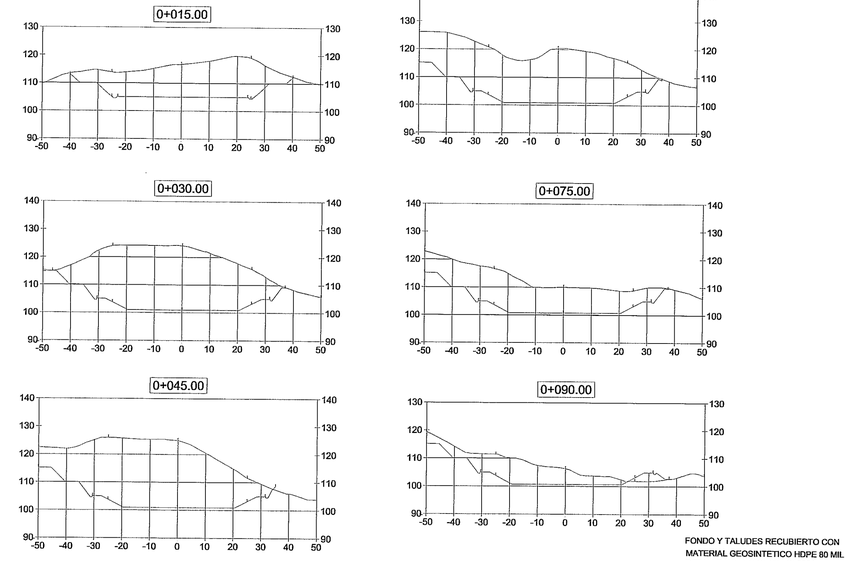
PLANTA PERFIL TUBERIA DE LIXIVIADOS
RELLENO-LAG. FACULTATIVA-LAG MADURACION

SCALE	JOB No.	DRG No.	REV.
1:500		1824-827-CI-8016	00

DRAWN / DATE

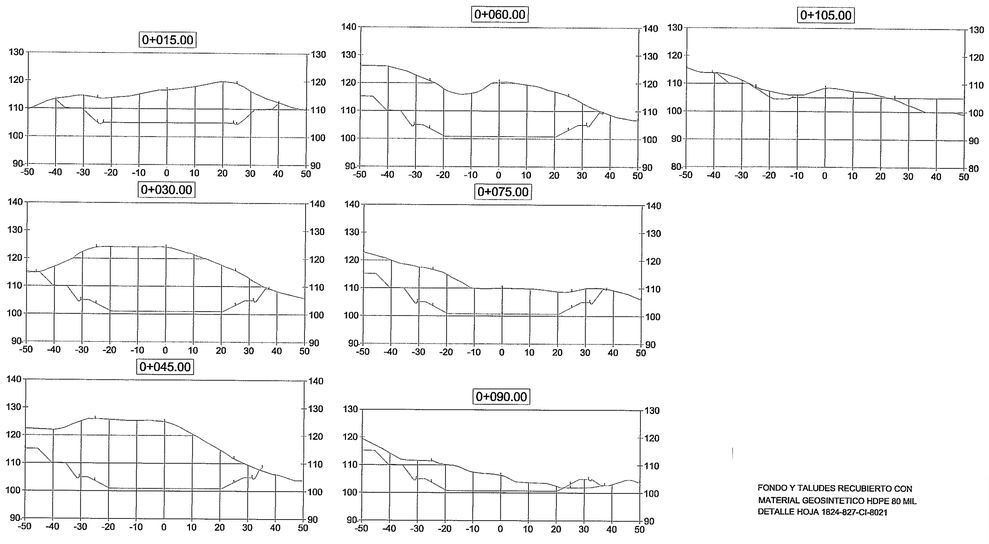


LAGUNA FACULTATIVA

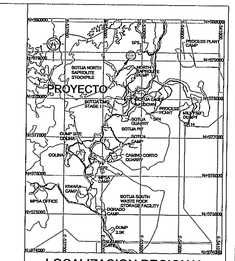


FONDO Y TALUDES RECUBIERTO CON
MATERIAL GEOSINTETICO HDPE 80 MIL
DETALLE HOJA 1824-827-CI-8021

LAGUNA DE MADURACION



FONDO Y TALUDES RECUBIERTO CON
MATERIAL GEOSINTETICO HDPE 80 MIL
DETALLE HOJA 1824-827-CI-8021



LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CHIMENEAS
- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- AREA DEL PROYECTO
- PRESA / TALUD ENROCADO
- EMBALSE
- BANQUETA
- TALUD
- LIMITE DE ETAPA

ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 85-0-6120
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

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2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS	DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHKD	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
						ISSUED FOR INFORMATION							

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

CLIENT MPSA

PROJECT MINA DE COBRE PANAMA

RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

DRAWING TITLE
SISTEMA DE TRATAMIENTO DE LIXIVIADOS

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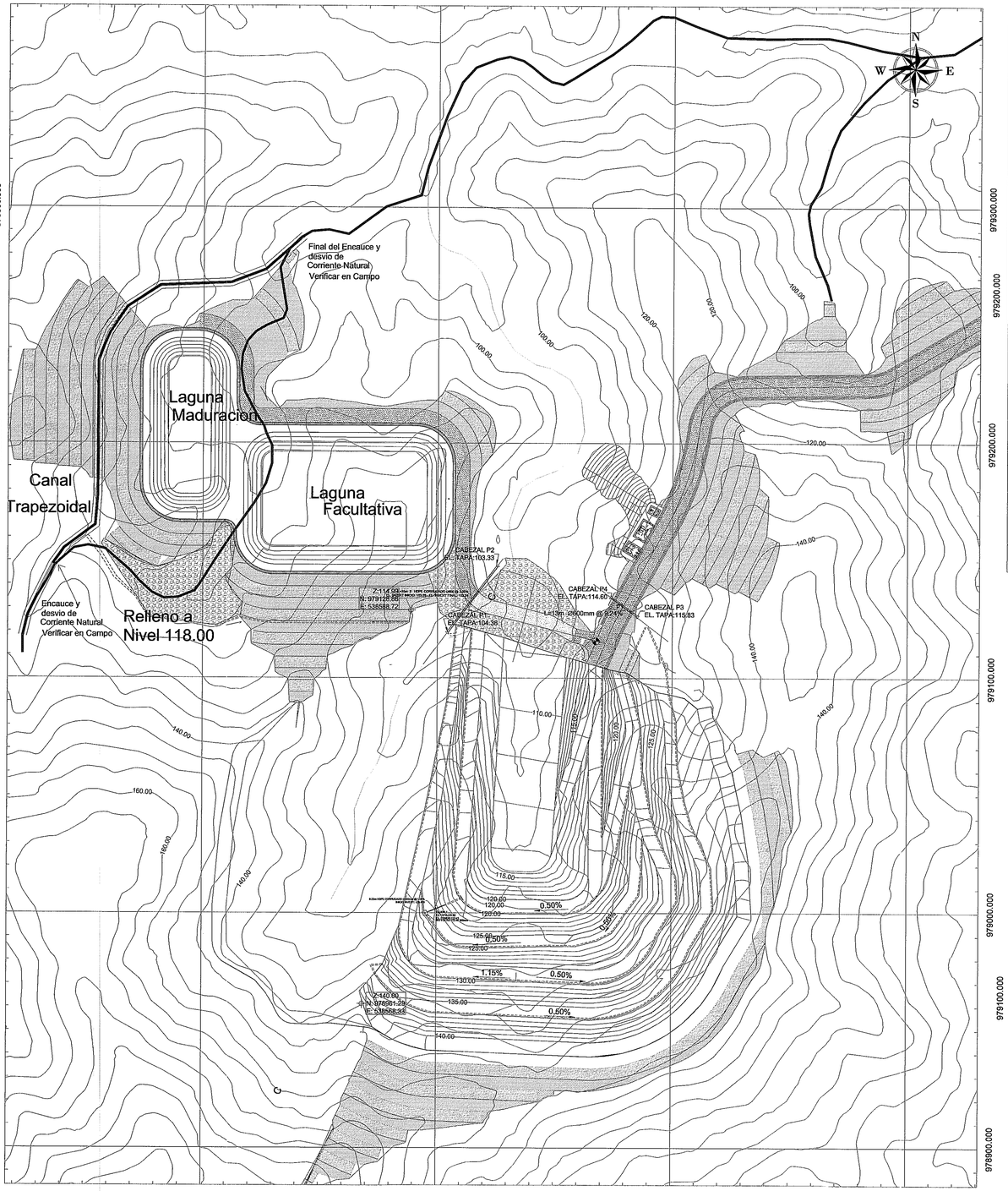
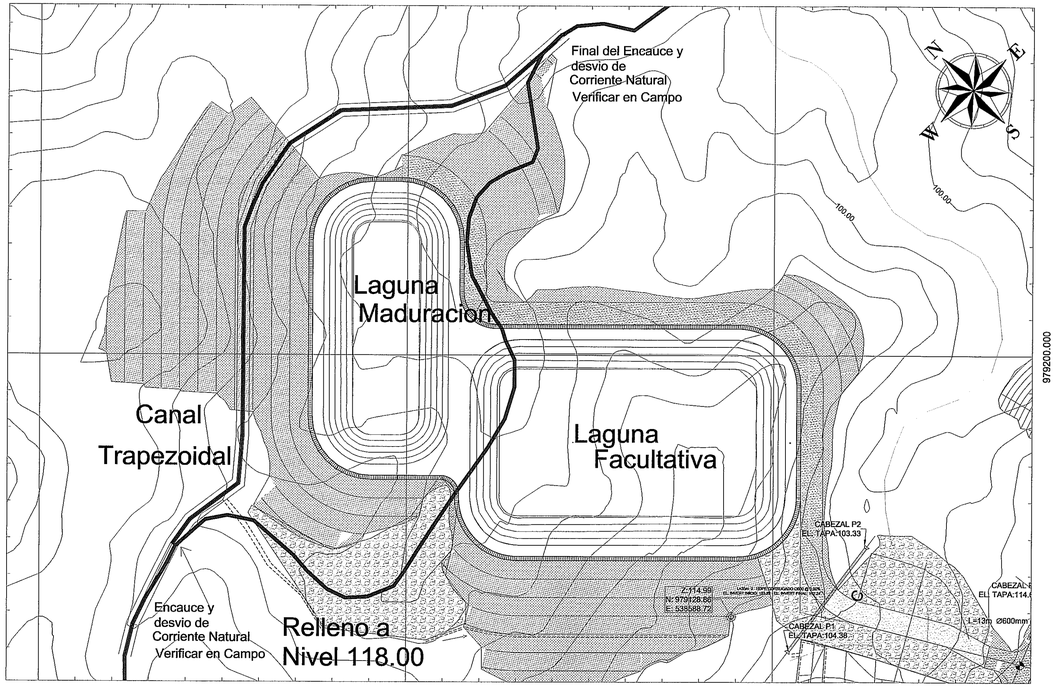
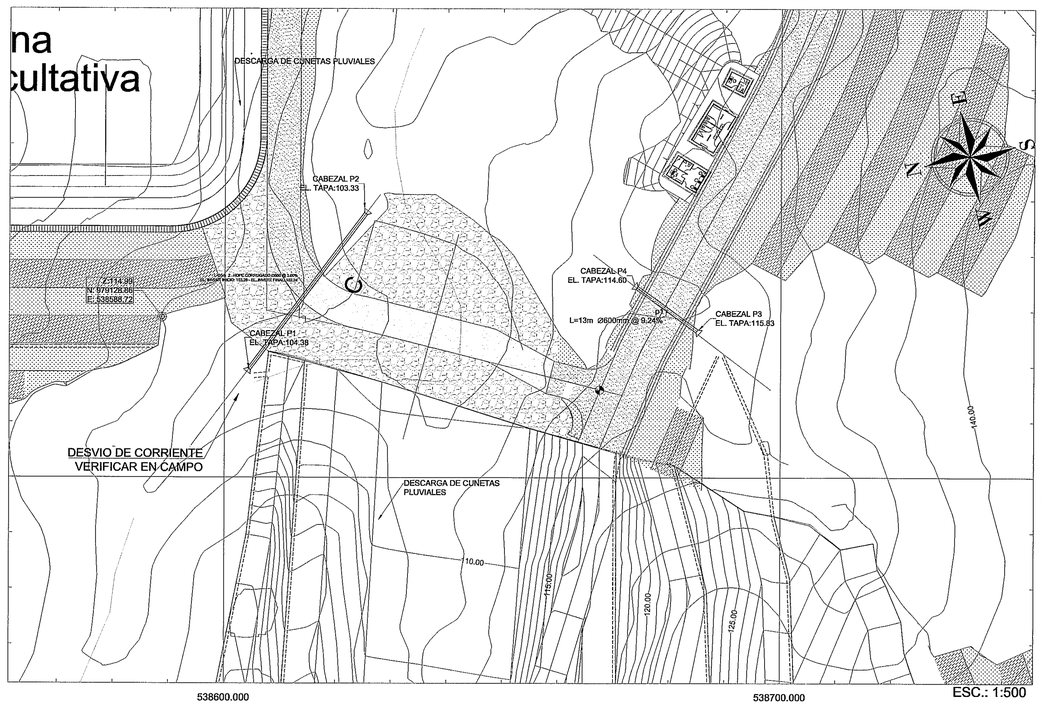
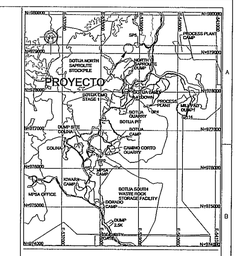
SCALE	JOB No.	DRG No.	REV.
1:500		1824-827-CI-8017	00

DRAWN | DATE









LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- CUNETAS PLUVIALES
- CURVAS MAYORES
- CURVAS MENORES
- HIDROGRAFIA
- AREA DEL PROYECTO
- PRESA / TALUD ENROCADO
- EMBALSE

ESC.: 1:500

ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88-0-6-20
PANAMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

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2. CONTOURS 2.00m

DRG No	REFERENCE DRAWINGS	DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
						ISSUED FOR INFORMATION							

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

CLIENT: MPSA

PROJECT: MINA DE COBRE PANAMA

FIRST QUANTUM MINERALS LTD.

RELLENO SANITARIO

DRAWING TITLE: SISTEMA DE INTERSECCION DE AGUAS PLUVIALES

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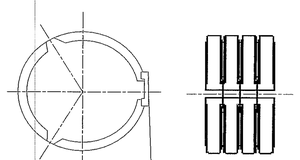
SCALE	JOB No.	DRG No.	REV.
1:1000		1824-827-CI-8018	00

DRAWN | DATE

DETALLE T - 1: JUNTAS

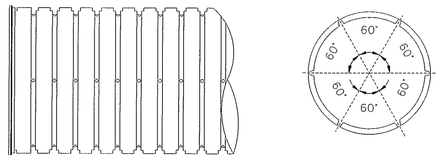
TAMAÑO DE TUBERIA	A
15 " (375 mm)	10.4 " (263 mm)
12 " (300 mm)	7.7 " (196 mm)



ENVOLVER ACOPLAMIENTO ALREDEDOR DE LOS EXTREMOS DEL TUBO, INSTALAR TRES CABLES DE BLOQUEO PLÁSTICO (Número de parte 1260 MC), A TRAVÉS DE ORIFICIOS DISPUESTOS EN ACOPLAMIENTO APRIETE FIRMEMENTE ALREDEDOR DE LA TUBERÍA

DETALLE T - 2:TUBERIA PERFORADA HDPE Ø 300 mm

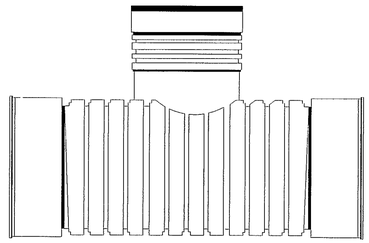
ESC: 1:7.5



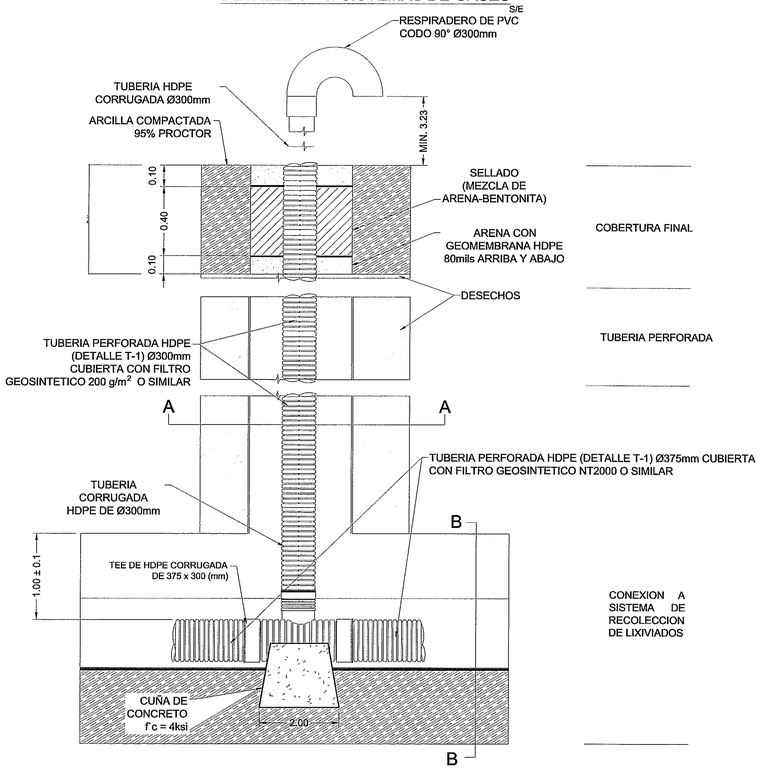
DETALLE T - 3: TEE DE HDPE PERFORADA

ESC: 1:7.5

TAMAÑO DE TUBERIA	A	B
15 " x 12 (375 x 300 mm)	25.9 " (658 mm)	14.1 " (359 mm)



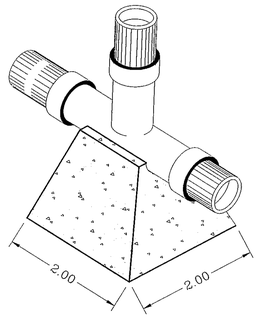
DETALLE T - 4: SISTEMAS DE GASES



DETALLE T - 5: YEE HDPE CORRUGADA

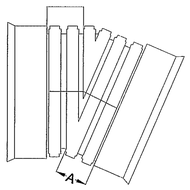
ESPECIFICACIONES DE YEE HDPE CORRUGADA				
TAMAÑO DE TUBERIA	A	B	C	TIPO DE JUNTA
15 " (375mm)	33 " (839mm)	23.5 " (642 mm)	25.4 " (645 mm)	ST
12 " (300mm)	25.8 " (654mm)	20.2 " (514 mm)	20.2 " (514 mm)	ST

ISOMETRICO DE ANCLAJE

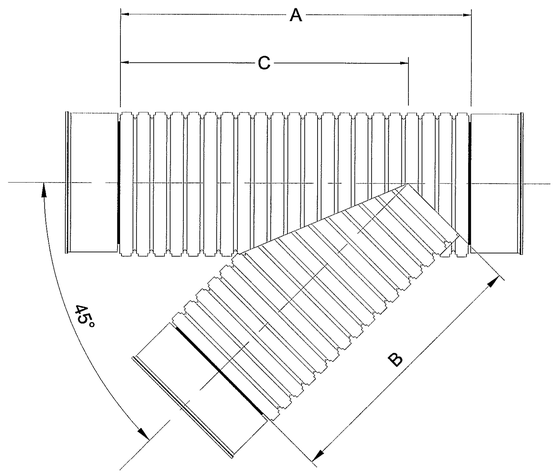


DETALLE T - 6: CONEXION

TAMAÑO DE TUBERIA	A	JUNTAS
15 " (375 mm)	11 " (280 mm)	*
15 " (375 mm)	6.0 " (152 mm)	ST
15 " (375 mm)	6.0 " (152 mm)	WT

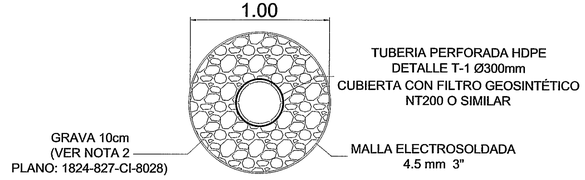


ST & WT (INCLUYE 2 JUNTAS)

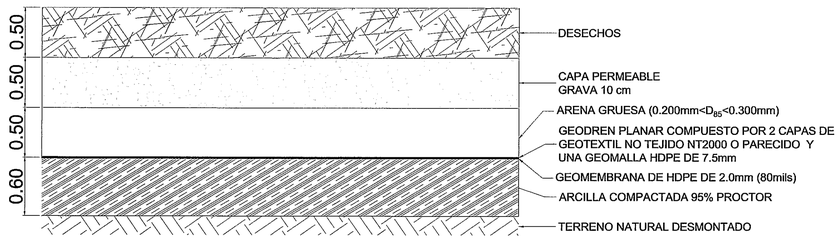


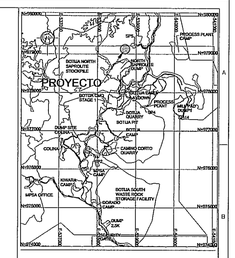
CORTE A - A

ESC: 1:25



CORTE B - B





LOCALIZACION REGIONAL
ESC: 1:50,000

ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88 0 (1
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

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						ISSUED FOR INFORMATION							

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DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT MPSA
PROJECT MINA DE COBRE PANAMA
RELLENO SANITARIO

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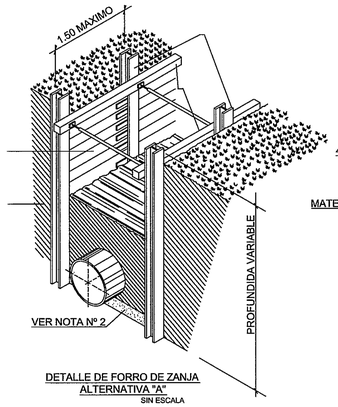
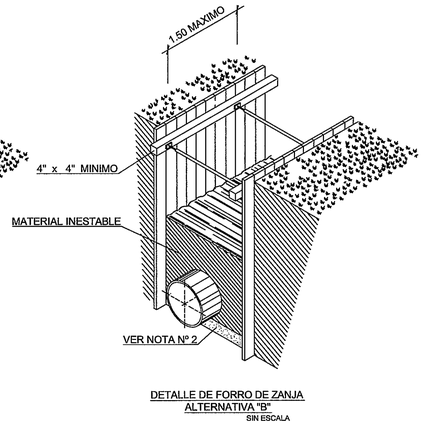
DRAWING TITLE
DETALLES DE TUBERIA DE SISTEMA DE RECOLECCION DE LIXIVIADOS Y GASES

SCALE	JOB No.	DRG No.	REV.
INDICADA		1824-827-CI-8019	00

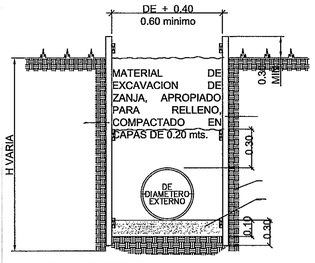
DRAWN | DATE



DETALLE DE FORRO DE ZANJA
ALTERNATIVA "A"
SIN ESCALA



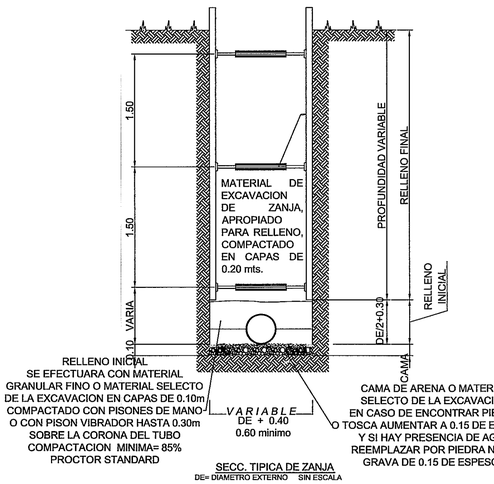
DETALLE DE FORRO DE ZANJA
ALTERNATIVA "B"
SIN ESCALA



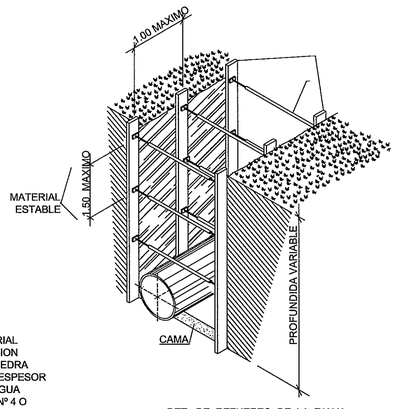
SECC. TIPICA DE ZANJA
MATERIAL INESTABLE SIN ESCALA

NOTAS GENERALES
1- LAS ALTERNATICAS A Y B DE FORROS DE ZANJA, SE UTILIZAN EN MATERIAL INESTABLE DE ACUERDO A LAS ESPECIFICICACIONES TECNICAS Y SE HINCARAN ANTES DE INICIAR LAS EXCAVACIONES.
2- EN CASO DE MATERIAL INESTABLE EN EL FONDO DE LA ZANJA, SE EXCAVARA 30 cm. O LO QUE INDIQUE EL INSPECTOR Y LUEGO SE RELLENARIA CON PIEDRA #2 HASTA NIVEL DE FONDO DE LA TUBERIA, SE COLOCA EL TUBO Y SE RELLENA CON PIEDRA #4.
3- SE UTILIZARA MAYOR REFUERZO TRANSVERSAL CUANDO EL INSPECTOR ASI LO EXIJA.
4- LOS TRAVESAÑOS PODRAN SER DE MADERA O GAZOS MECANICOS.
5- CUALQUIER VARIACION DE ESTE DISEÑO SERA SOMETIDA A LA APROBACION DE LA INSPECCION.
6- ANTES DE EXTRAER CUALQUIER FORRO O REFUERZO SE DEBERA OBTENER EL PERMISO DEL INSPECTOR.

DETALLES DE FORRO DE ZANJA


1.50
1.50
MATERIAL DE EXCAVACION DE ZANJA, APROPIADO PARA RELLENO, COMPACTADO EN CAPAS DE 0.20 mts.
PROFUNDIDAD VARIABLE
RELLENO FINAL
RELLENO INICIAL
H VARIA
0.10
DE/2+0.30
CAMA
VARIABLE
DE + 0.40
0.60 minimo
RELLENO INICIAL
SE EFECTUARA CON MATERIAL GRANULAR FINO O MATERIAL SELECTO DE LA EXCAVACION EN CAPAS DE 0.10m COMPACTADO CON PISONES DE MANO O CON PISON VIBRADOR HASTA 0.30m SOBRE LA CORONA DEL TUBO
COMPACTACION MINIMA= 85% PROCTOR STANDARD
CAMA DE ARENA O MATERIAL SELECTO DE LA EXCAVACION EN CASO DE ENCONTRAR PIEDRA O TOSCA AUMENTAR A 0.15 DE ESPESOR Y SI HAY PRESENCIA DE AGUA REEMPLAZAR POR PIEDRA Nº 4 O GRAVA DE 0.15 DE ESPESOR

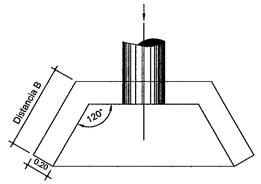
SECC. TIPICA DE ZANJA
DE= DIAMETRO EXTERNO SIN ESCALA



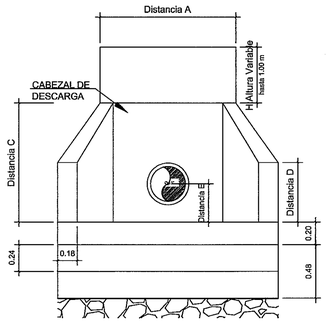
DET. DE REFUERZO DE LA ZANJA
SIN ESCALA

SE USARA REFUERZO DE ZANJA CUANDO LA PROFUNDIDAD SEA MAYOR DE 1.50 mts.

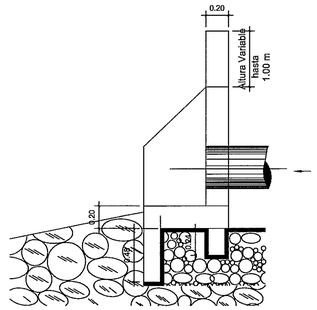
DETALLES DE REFUERZO DE ZANJA



PLANTA
CABEZAL DE DESCARGA



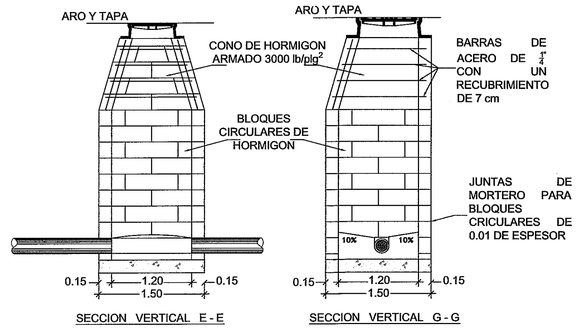
VISTA FRONTAL
CABEZAL DE DESCARGA



VISTA LATERAL
CABEZAL DE DESCARGA

MEDIDAS DE DISEÑO DE CABEZAL SEGUN DIAMETRO DE TUBERIA

DIÁMETRO DE LA TUBERÍA	DISTANCIA A	DISTANCIA B	DISTANCIA C	DISTANCIA D	DISTANCIA E	PESO APROXIMADO
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(lb)
300	900	750	900	450	300	3845
375	1200	750	1050	525	337.5	4760
450	1200	750	1050	525	375	4760
600	1500	900	1200	600	450	6090
750	1800	900	1350	675	525	7475
900	1950	1200	1500	750	600	9945
1200	2100	1200	1800	900	750	11325



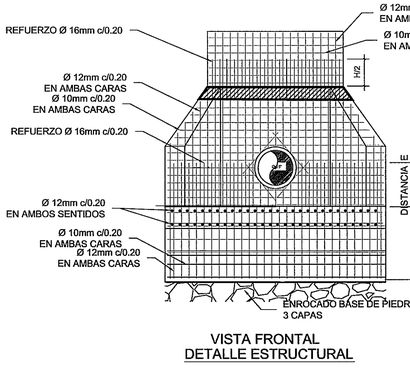
DETALLES DE CAMARA DE INSPECCION

NOTAS IMPORTANTES
1 - VACIESE PRIMERO UNA BASE CON ESPESOR MINIMO DE 15 cm EL CEMENTO PORTLAND A USAR SERA TIPO I
2 - LA PROFUNDIDAD DEL CANAL EN EL FONDO DE LA CAMARA DE INSPECCION SERA IGUAL AL DIAMETRO DE LA TUBERIA DE SALIDA
3 - TODO EL HORMIGON SERA DE 210 Kg/cm^2 A LOS 28 DIAS
4 - LOS BLOQUES CIRCULARES PRE-FABRICADOS SE UNIRAN CON UNA CAPA DE 1.0 cm DE MORTERO EN PROPORCION DE 1:2 SIN ESPACIOS ENTRE PAREDES. LAS JUNTAS SE REPELLAN POR DENTRO Y POR FUERA

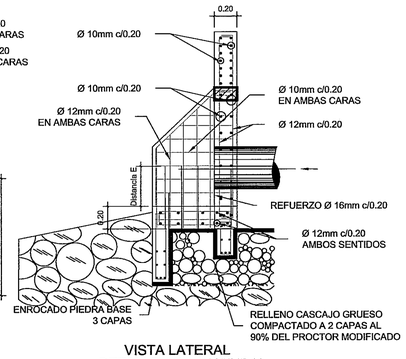
DETALLE DE BLOQUES CIRCULARES

SECCION B - B

LOCALIZACION REGIONAL
ESC. 1:50,000

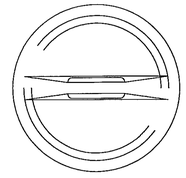

REFUERZO Ø 16mm c/0.20
Ø 12mm c/0.20 EN AMBAS CARAS
Ø 10mm c/0.20 EN AMBAS CARAS
H/2
Ø 12mm c/0.20 EN AMBAS CARAS
Ø 10mm c/0.20 EN AMBAS CARAS
REFUERZO Ø 16mm c/0.20
Ø 12mm c/0.20 EN AMBOS SENTIDOS
Ø 10mm c/0.20 EN AMBAS CARAS
Ø 12mm c/0.20 EN AMBAS CARAS
DISTANCIA E
VARIABLE
ENROCADO BASE DE PIEDRA 3 CAPAS

VISTA FRONTAL
DETALLE ESTRUCTURAL


0.20
Ø 10mm c/0.20
Ø 10mm c/0.20
Ø 10mm c/0.20 EN AMBAS CARAS
Ø 12mm c/0.20 EN AMBAS CARAS
Ø 12mm c/0.20
Distancia E
0.20
REFUERZO Ø 16mm c/0.20
Ø 12mm c/0.20 AMBOS SENTIDOS
ENROCADO PIEDRA BASE 3 CAPAS
RELLENO CASCAJO GRUESO COMPACTADO A 2 CAPAS AL 90% DEL PROCTOR MODIFICADO

VISTA LATERAL
DETALLE ESTRUCTURAL

TAMAÑO DE TAPA
24 " (600 mm)



ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88 8-6-20
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N
2. CONTOURS 5.00m

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D	REV	DATE	DESCRIPTION
							ISSUED FOR INFORMATION

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

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DRAWING TITLE: DETALLES DE CAMARA DE INSPECCIÓN Y CABEZALES

SCALE	JOB No.	DRG No.	REV.
DRAWN / DATE		1824-827-CI-8020	00

NOTA 1

Propiedad	Unidad	Metodo de Prueba	No Tejido
Peso (Tipico)	oz/sy	ASTM	6.00
	(g/sm)	D5261	(203.00)
Esfuerzo traccion	lbs (kN)	ASTM	160.00
		D4632	(0.71)
Esfuerzo de elongaciol	%	ASTM D4632	50.00
Corte Trapezoidal	lbs (kN)	ASTM	65.00
		D4533	(0.29)
Resistencia de Punzonamiento	lbs (kN)	ASTM D4833	90.00
			(0.40)
Permisivdad	l/sec	ASTM D4491	1.60
Flujo de Agua	gpm/sf	ASTM	110.00
	(1/min/sm)	D4491	(4480.00)
A.O.S.:	U.S. Sieve	ASTM	70.00
	(mm)	D4751	(0.21)
Resistencia a Rayos Ultravioleta	%/hrs	ASTM D4355	70/500
At time of manufacturing. Handling, storage and shipping may change these properties.			
Empaquetado			
Dimensiones del Rollo en pies			12.5 x 360 15 x 300
Area cubierta en yd2			500.00
Peso estimado del Rollo			195.00

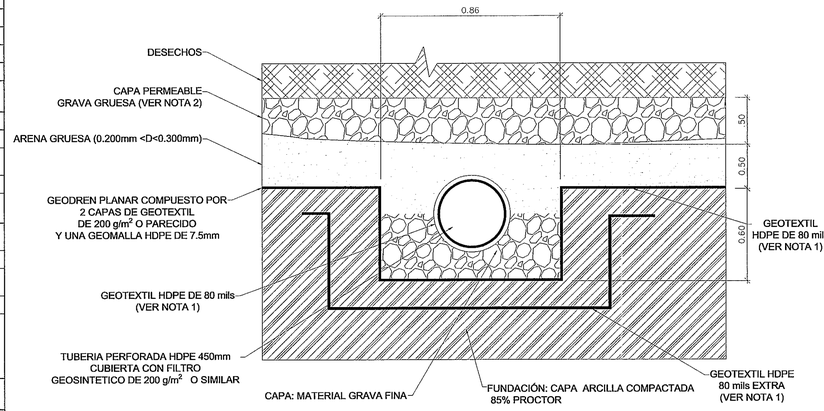
NOTA 2

Material de filtro - Grava gruesa		
Designación del tamiz mm (Tamiz #)	Porcentaje de aprobados en peso (%)	
	limite grueso	limite fino
150	100	100
100	70	100
75	60	100
38	45	70
19	30	50
4.75 (#4)	10	25
2.0 (#10)	0	15
0.425 (#40)	0	5
Material de filtro - Grava fina		
19 (3/4")	100	100
9.5 (3/8")	70	100
4.75 (#4)	50	85
2	30	65
0.85 (#20)	18	48
0.25 (#60)	0	25
0.075 (#200)	0	3

NOTA 3

Propiedad	Método de Prueba	Valor de Prueba
Espesor	ASTM D-5199	80 MIL
Densidad	ASTM D-1505/D-792	0.940 g/cc
Esfuerzo de Cedencia		168 lb/in
Esfuerzo de Rotura		304 lb/in
Elongacion de Cedencia		12%
Elongacion de Rotura		700%
Resistencia al Corte (min. avg)	ASTM D-1004	56 lb
Resistencia al Punzonamiento (min. avg)	ASTM D-4833	144 lb
Resistencia a Esfuerzo de Grieta	ASTM D-5397 (App.)	500 hr
Rango de contenido de Carbon'negro	ASTM D-1603	2.0 - 3.0 %
Estandar OIT	ASTM D-3895	100 min
Máxima Presión OIT	ASTM D-5885	400 min
Estandar OIT (min. avg) - % retenido despues de 90 days	ASTM D-3895	55%
Máxima Presión OIT (min. avg) - % retenido depues de 90 days	ASTM D-5885	80%
Máxima Presión OIT (min. avg) - % retenido despues de 1600 hours	ASTM D-5885	50%

DETALLE G - 1


0.86
DESECHOS
CAPA PERMEABLE GRAVA GRUESA (VER NOTA 2)
ARENA GRUESA (0.200mm <D<0.300mm)
GEODREN PLANAR COMPUESTO POR 2 CAPAS DE GEOTEXTIL DE 200 g/m2 O PARECIDO Y UNA GEOMALLA HDPE DE 7.5mm
GEOTEXTIL HDPE DE 80 mils (VER NOTA 1)
TUBERIA PERFORADA HDPE 450mm CUBIERTA CON FILTRO GEOSINTETICO DE 200 g/m2 O SIMILAR
CAPA: MATERIAL GRAVA FINA
FUNDACIÓN: CAPA ARCILLA COMPACTADA 85% PROCTOR
GEOTEXTIL HDPE 80 mils EXTRA (VER NOTA 1)
0.50
0.60

NOTA:

A. TOMAR LAS MEDIDAS NECESARIAS PARA EVITAR EL DESPLAZAMIENTO DE ARENA FINA EN EL MATERIAL DE RELLENO, CUANDO SEA NECESARIO.

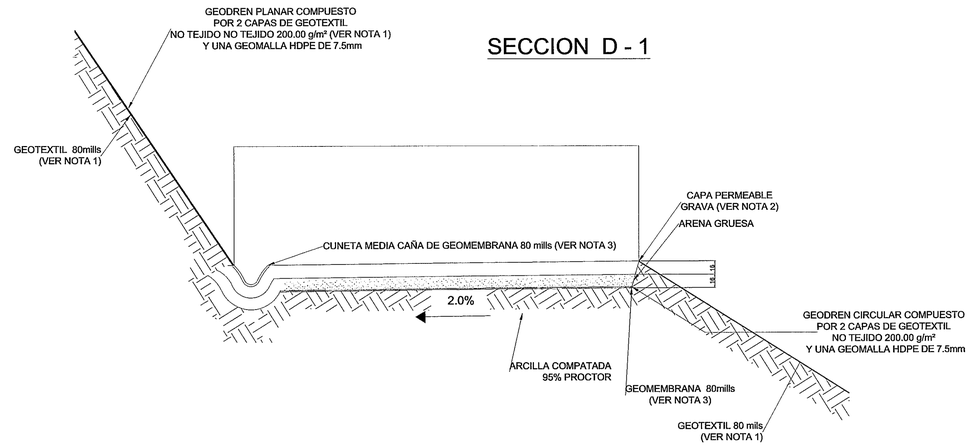
B. FUNDACIÓN: DONDE EL FONDO DE LA ZANJA ES INESTABLE, EL CONTRATISTA DEBERÁ EXCAVAR A UNA PROFUNDIDAD REQUERIDA POR EL DISEÑO Y REEMPLAZAR CON MATERIAL ADECUADO SEGÚN LO ESPECIFICADO EN EL DISEÑO. COMO ALTERNATIVA Y A DISCRECIÓN DE DISEÑO, EL FONDO DE LA ZANJA PUEDE SER ESTABILIZADO USANDO UN MATERIAL GEOTEXTIL.

C. CAPA: EL MATERIAL ADECUADO SERÁ GRANULAR SELECTOI. EL CONTRATISTA PROPOCIONARÁ LA DOCUMENTACIÓN CON LAS ESPECIFICACIONES DEL MATERIAL AL INGENIERO. A MENOS QUE EL INGENIERO INDIQUE LO CONTRARIO, EL ESPESOR MÍNIMO DE LA CAPA SERÁ DE 4" (100mm) PARA 4"- 24" (100mm - 600mm); 6" (150mm) PARA 30"- 60" (750mm - 900mm).

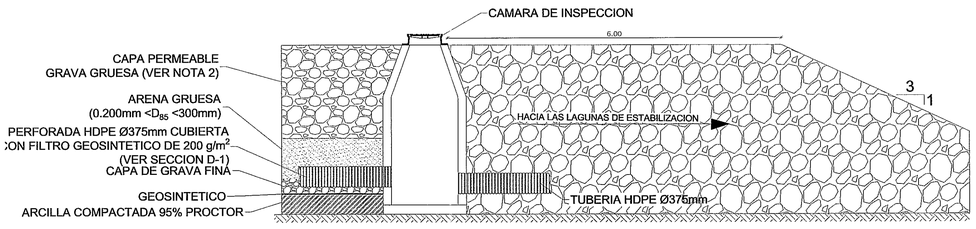
D. COBERTURA MÍNIMA: LA COBERTURA MÍNIMA, H, EN APLICACIONES (ZONAS DE CESPED O PAISAJE ES DE 12" (300mm) DESDE LA PARTE SUPERIOR DE LA TUBERÍA HASTA LA SUPERFICIE DEL TERRENO. LA COBERTURA ADICIONAL PUEDE SER NECESARIA PARA EVITAR LA FLOTACIÓN.

E. SELECCIÓN DEL RELLENO DEBE SER UN LUGAR LIMPIO, MODERADAMENTE COMPACTADO (85% SPD) CLASE IV O SUPERIOR SEGÚN LA NORMA ASTM D2321 SIN RESIDUOS EXTRAÑOS COMO ROCAS, GRANDES CANTIDAD DE MATERIA ORGANICA.

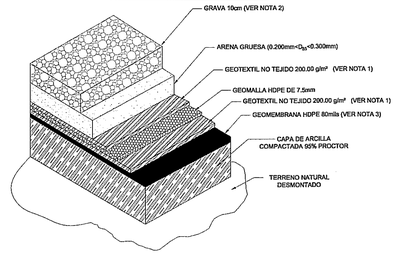
SECCION D - 1


GEODREN PLANAR COMPUESTO POR 2 CAPAS DE GEOTEXTIL NO TEJIDO NO TEJIDO 200.00 g/m² (VER NOTA 1) Y UNA GEOMALLA HDPE DE 7.5mm
GEOTEXTIL 80mills (VER NOTA 1)
CAPA PERMEABLE GRAVA (VER NOTA 2)
ARENA GRUESA
CUNETA MEDIA CAÑA DE GEOMEMBRANA 80 mills (VER NOTA 3)
1.50
2.0%
GEODREN CIRCULAR COMPUESTO POR 2 CAPAS DE GEOTEXTIL NO TEJIDO 200.00 g/m² Y UNA GEOMALLA HDPE DE 7.5mm
ARCILLA COMPATADA 95% PROCTOR
GEOMEMBRANA 80mills (VER NOTA 3)
GEOTEXTIL 80 mils (VER NOTA 1)

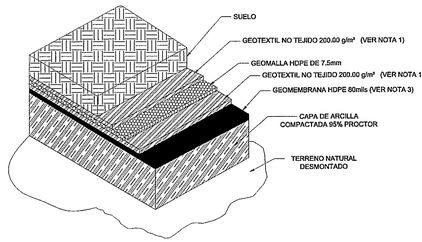
DETALLE D - 2


CAMARA DE INSPECCION
6.00
CAPA PERMEABLE GRAVA GRUESA (VER NOTA 2)
ARENA GRUESA (0.200mm <D85 <300mm)
PERFORADA HDPE Ø375mm CUBIERTA CON FILTRO GEOSINTETICO DE 200 g/m2 (VER SECCION D-1)
CAPA DE GRAVA FINA
GEOSINTETICO
ARCILLA COMPACTADA 95% PROCTOR
HACIA LAS LAGUNAS DE ESTABILIZACION
3
1
TUBERIA HDPE Ø375mm

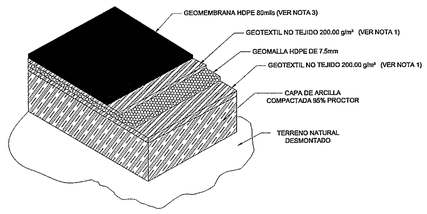
DETALLE G - 2: IMPERMEABILIZACION DE FONDO DEL RELLENO


GRAVA 10cm (VER NOTA 2)
ARENA GRUESA (0.200mm<D85<0.300mm)
GEOTEXTIL NO TEJIDO 200.00 g/m² (VER NOTA 1)
GEOMALLA HDPE DE 7.5mm
GEOTEXTIL NO TEJIDO 200.00 g/m² (VER NOTA 1)
GEOMEMBRANA HDPE 80mils (VER NOTA 3)
CAPA DE ARCILLA COMPACTADA 95% PROCTOR
TERRENO NATURAL DESMONTADO

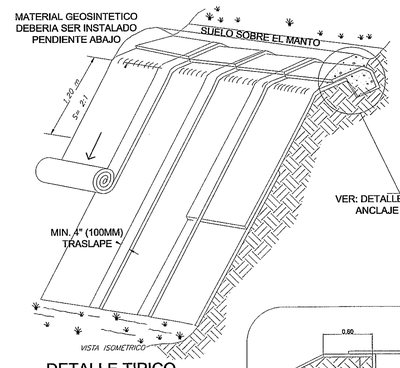
DETALLE G - 3: IMPERMEABILIZACION DE TALUDES DEL RELLENO


SUELO
GEOTEXTIL NO TEJIDO 200.00 g/m² (VER NOTA 1)
GEOMALLA HDPE DE 7.5mm
GEOTEXTIL NO TEJIDO 200.00 g/m² (VER NOTA 1)
GEOMEMBRANA HDPE 80mils (VER NOTA 3)
CAPA DE ARCILLA COMPACTADA 95% PROCTOR
TERRENO NATURAL DESMONTADO

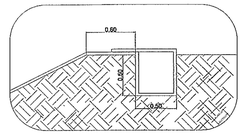
DETALLE G - 5: IMPERMEABILIZACION DE FONDO Y TALUDES DE LAS LAGUNAS


GEOMEMBRANA HDPE 80mils (VER NOTA 3)
GEOTEXTIL NO TEJIDO 200.00 g/m² (VER NOTA 1)
GEOMALLA HDPE DE 7.5mm
GEOTEXTIL NO TEJIDO 200.00 g/m² (VER NOTA 1)
CAPA DE ARCILLA COMPACTADA 95% PROCTOR
TERRENO NATURAL DESMONTADO

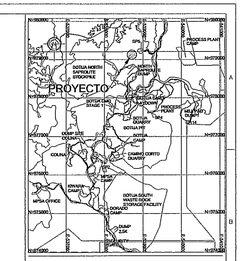
DETALLE G - 4: INSTALACION DE GEOSINTETICOS



DETALLE TIPICO ESTABILIZACION DE SUELO



DETALLE DE ANCLAJE



ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic No. 88-0-20
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

1. ALL DIMENSIONS, ELEVATIONS AND GRID COORDINATES SHOWN ON THIS DRAWING ARE IN METERS. GRID SHOWN IS REFERENCED TO UTM WGS84 ZONE 17N DATUM.

DRG No	REFERENCE DRAWINGS	DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
						ISSUED FOR INFORMATION							

	DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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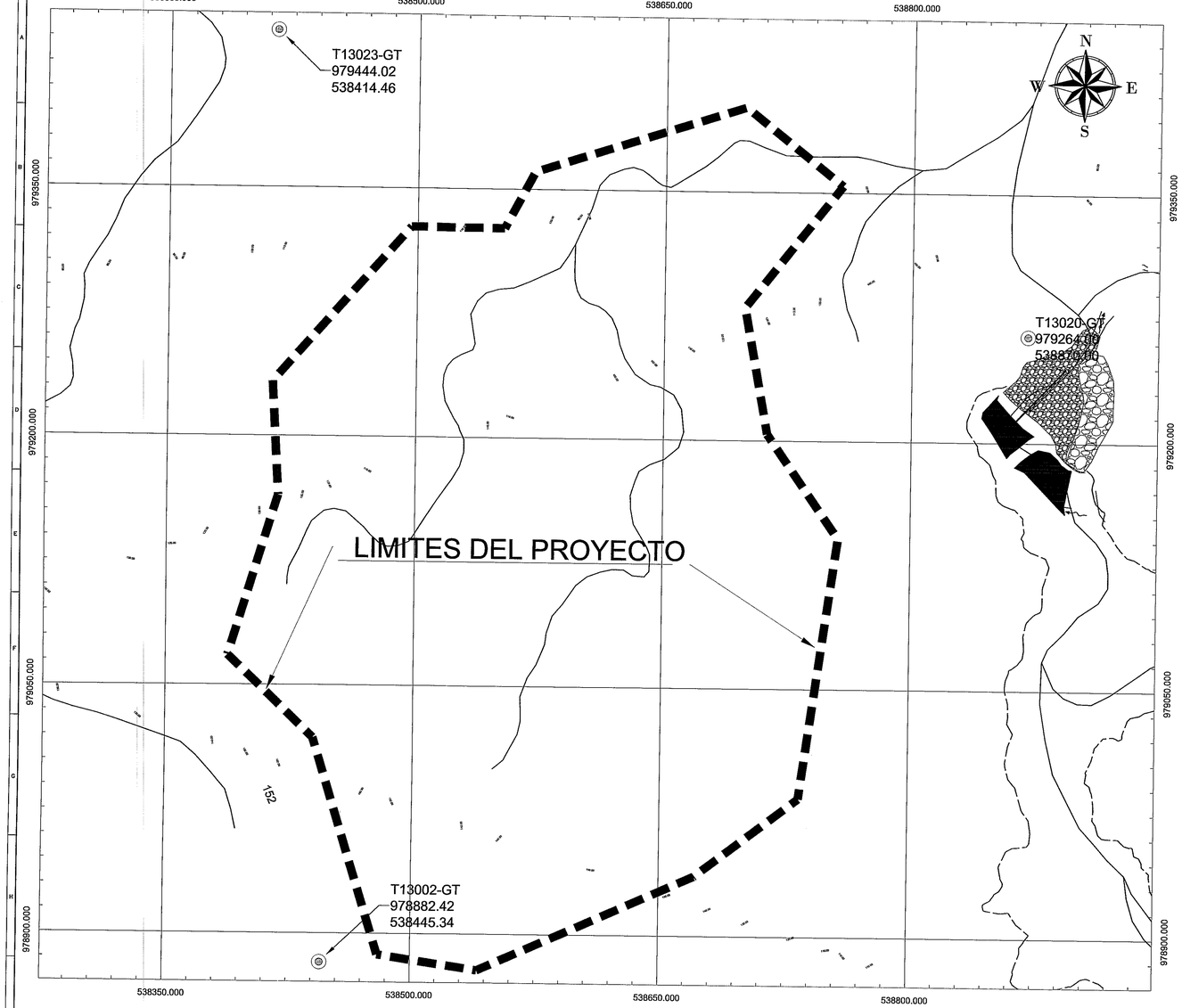
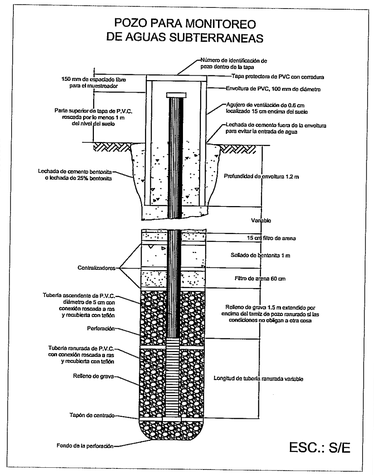
DRAWING TITLE: DETALLES DE GEOSINTETICOS

SCALE	JOB No.	DRG No.	REV.
INDICADA		1824-827-CI-8021	00

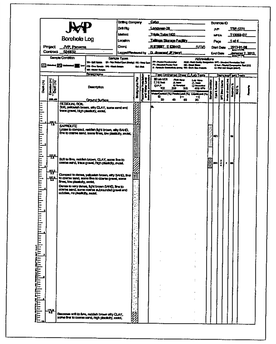
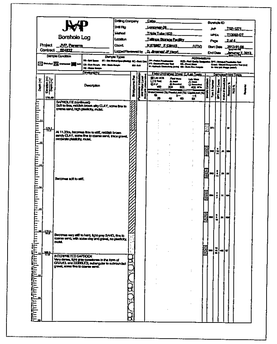
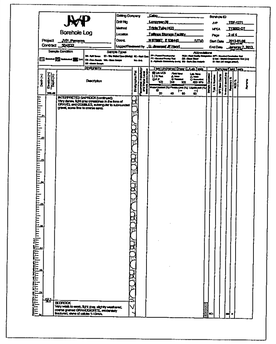
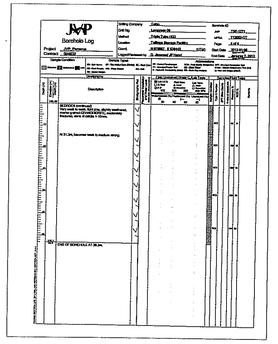
DRAWN | DATE



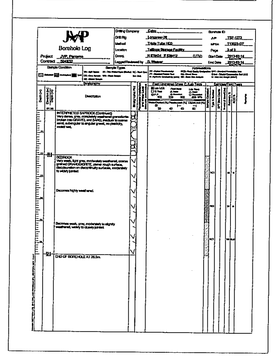

POZO PARA MONITOREO
DE AGUAS SUBTERRANEAS
Número de identificación de pozo dentro de la tapa
Tapa protectora de PVC con cerradura
Envoltura de PVC, 100 mm de diámetro
Agujero de ventilación de 0.6 cm localizado 15 cm encima del suelo
Lechada de cemento fuera de la envoltura para evitar la entrada de agua
150 mm de especiado libre para el revestimidor
Parte superior de tapa de P.V.C. rosacia por lo menos 1 m del nivel del suelo
Lechada de cemento bentonita o lechada de 20% bentonita
Profundidad de envoltura 1.2 m
Variable
15 cm filtro de arena
Sellado de bentonita 1 m
Filtro de arena 60 cm
Centralizadores
Tubería ascendente de P.V.C. diámetro de 5 cm con conexión roscada a ras y moldeada con teflón
Relleno de grava 1.5 m extendido por encima del tramo de pozo ranurado si las condiciones no obligan a otra cosa
Perforación
Tubería ranurada de P.V.C. con conexión roscada a ras y moldeada con teflón
Relleno de grava
Longitud de tubería ranurada variable
Tapón de centrado
Fondo de la perforación
ESC.: S/E

POZOS DE MONITOREO			
Elevation	Northing	Easting	Description
188.57	978882.42	538445.34	T13002-GT
82.50	979444.02	538414.46	T13023-GT
88.00	979264.00	538870.00	T13020-GT

T13002-GT

T13023-GT



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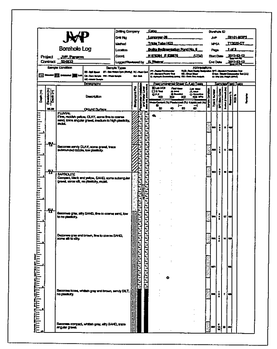
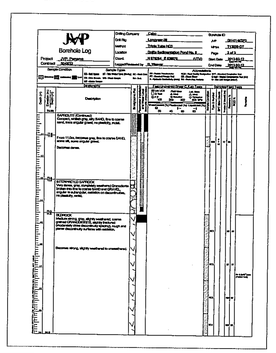
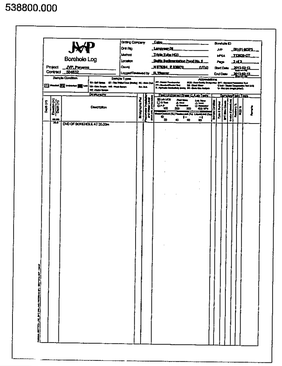

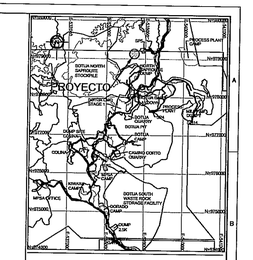

LOCALIZACION REGIONAL
ESC. 1:50,000

LEYENDA

- POZO
- CURVAS MAYORES
- HIDROGRAFIA
- AREA DEL PROYECTO
- PRESA / TALUD ENROCADO
- EMBALSE

ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88-06-[illegible]
FIRMA
LEY 15 DEL 26 DE ENERO DE 19[illegible]
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

NOTES:

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2. CONTOURS 1.00m

DRG No	REFERENCE DRAWINGS	DRG No	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D
						ISSUED FOR INFORMATION							

REV	DATE	DESCRIPTION	DRN	CHK'D	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

Minera Panamá

DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

CLIENT: MPSA
PROJECT: MINA DE COBRE PANAMA
RELLENO SANITARIO

FIRST QUANTUM MINERALS LTD.

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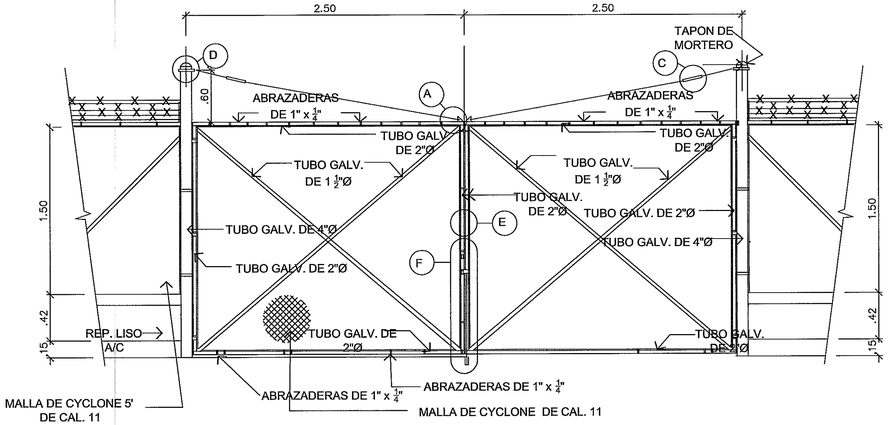
DRAWING TITLE
UBICACION DE POZOS PARA MONITOREO DE AGUAS SUBTERRANEAS E INFORMACIÓN GEOTECNICA

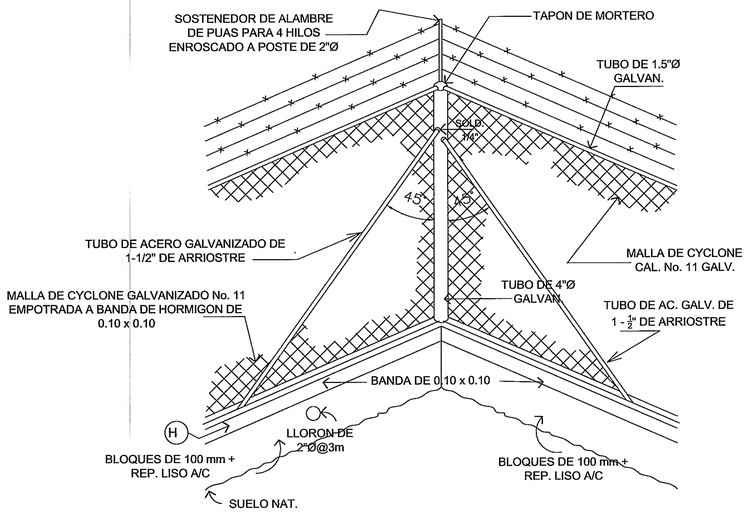
SCALE	JOB No.	DRG No.	REV.
1:1500		1824-827-CI-8022	00

DRAWN | DATE



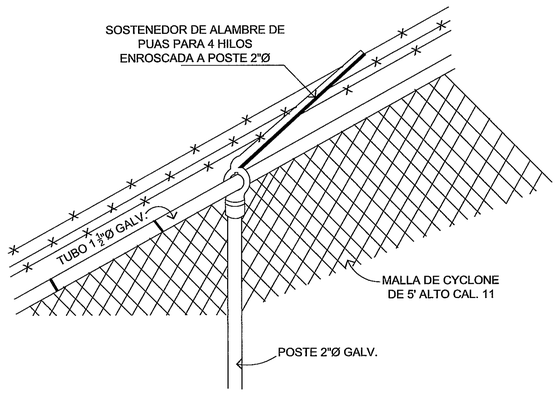
DETALLE DE PUERTA CERCA CYCLON

ESC: 1:25


SOSTENEDOR DE ALAMBRE DE PUAS PARA 4 HILOS ENROSCADO A POSTE DE 2"Ø
TAPON DE MORTERO
TUBO DE 1.5"Ø GALVAN.
SOLD. ¼"
45°
45°
TUBO DE ACERO GALVANIZADO DE 1-1/2" DE ARRIOSTRE
MALLA DE CYCLONE CAL. No. 11 GALV.
MALLA DE CYCLONE GALVANIZADO No. 11 EMPOTRADA A BANDA DE HORMIGON DE 0.10 x 0.10
TUBO DE 4"Ø GALVAN.
TUBO DE AC. GALV. DE 1 - ½" DE ARRIOSTRE
BANDA DE 0.10 x 0.10
H
LLORON DE 2"Ø@3m
BLOQUES DE 100 mm + REP. LISO A/C
BLOQUES DE 100 mm + REP. LISO A/C
SUELO NAT.

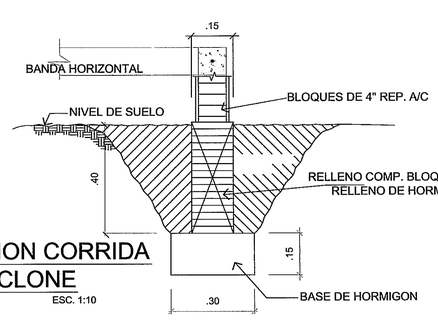
DETALLE TIPICO DE ESQUINA CERCA CYCLON

ESC. 1:10


SOSTENEDOR DE ALAMBRE DE PUAS PARA 4 HILOS ENROSCADA A POSTE 2"Ø
TUBO 1 ½"Ø GALV.
MALLA DE CYCLONE DE 5' ALTO CAL. 11
POSTE 2"Ø GALV.

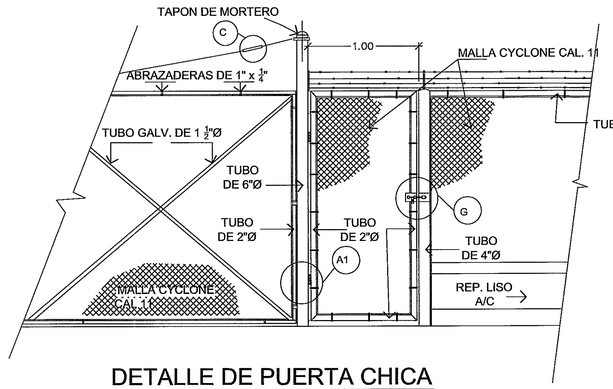
DETALLE ISOMETRICO

ESC. 1:10



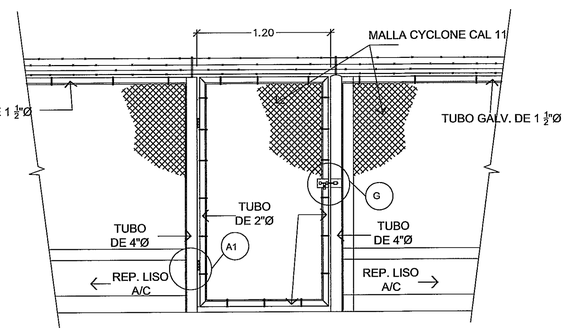
DET. DE FUNDACION CORRIDA CERCA CYCLONE

ESC. 1:10



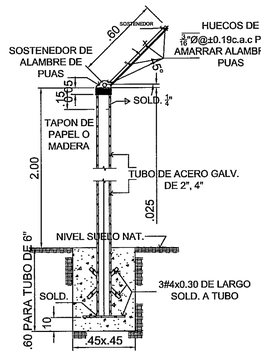
DETALLE DE PUERTA CHICA

ESC: 1:25



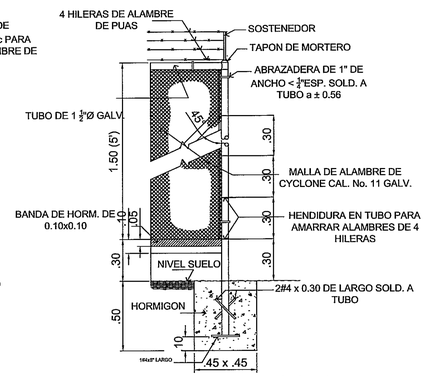
DETALLE DE PUERTA EN VEREDA

ESC: 1:25



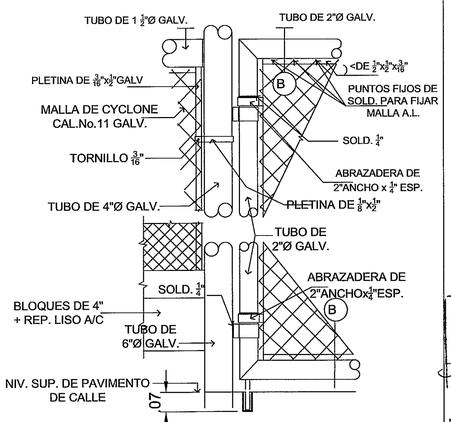
CIM. DE CERCA (TUBO 2"Ø - 4"Ø)

ESC: 1:20


4 HILERAS DE ALAMBRE DE PUAS
SOSTENEDOR
TAPON DE MORTERO
ABRAZADERA DE 1" DE ANCHO < ¾"ESP. SOLD. A TUBO a ± 0.56
TUBO DE 1 ½"Ø GALV.
45°
1.50 (5')
.30
MALLA DE ALAMBRE DE CYCLONE CAL. No. 11 GALV.
BANDA DE HORM. DE 0.10x0.10
HENDIDURA EN TUBO PARA AMARRAR ALAMBRES DE 4 HILERAS
NIVEL SUELO
2#4 x 0.30 DE LARGO SOLD. A TUBO
HORMIGON
.50
.45 x .45

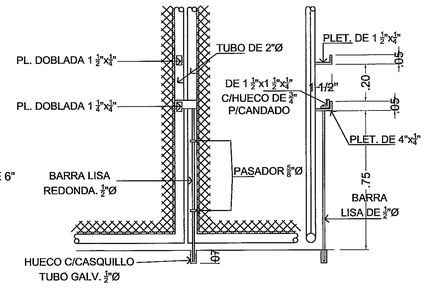
DET. TIP. DE POSTE 2"Ø CERCA CYCLONE

ESC: 1:20



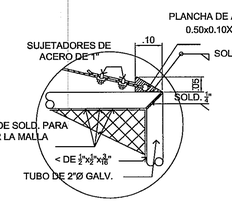
G DET. DE BISAGRA PARA PUERTA DE TUBO 2"Ø

ESC:1:10



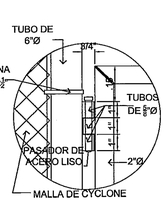
DETALLE "H"

1:15



DETALLE "A"

ESC: 1:25



DETALLE "A1"

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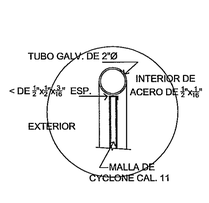
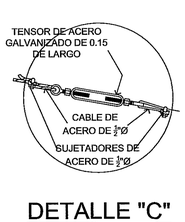


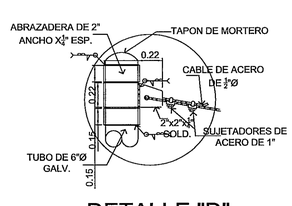
DETALLE "B"

ESC: 1:25



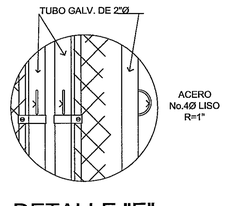
DETALLE "C"

ESC: 1:25



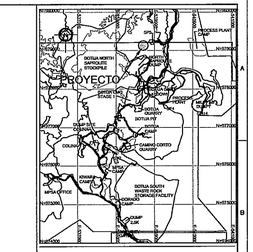
DETALLE "D"

ESC: 1:25



DETALLE "E"

ESC: 1:25



ESC. 1:50,000

ERICK N. VALLESTER E.
INGENIERO CIVIL
Lic. No. 88-006-070
FIRMA
LEY 15 DEL 26 DE ENERO DE 1959
JUNTA TECNICA DE INGENIERIA Y ARQUITECTURA

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						ISSUED FOR INFORMATION							

Minera Panamá

CLIENT	MPSA
PROJECT	MINA DE COBRE PANAMA
	RELLENO SANITARIO

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DRAWN	CHECKED	DESIGN ENG.	LEAD ENG.	DESIGN APP'D	PROJ. APP'D	CLIENT APP'D

DRAWING TITLE: DETALLES DE CERCA PERIMETRAL

SCALE	JOB No.	DRG No.	REV.
INDICADA		1824-827-CI-8023	00

DRAWN | DATE

538650.000

538700.000

538750.000

979200.000

979150.000

CALLE DE ACCESO

GARITA
HOJA 1824-827-8025

VESTIDORES
HOJA 1824-827-8027

OFICINA ADMINISTRATIVA
HOJA 1824-827-8025

CULVERT 2

1:1

5.00

6.00

3:1

1.50:1

110.00

100.00

115.00

120.00

130.00

140.00

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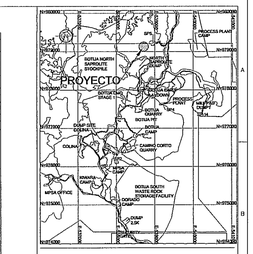
N

S

E

W


PROYECTO
MPSA OFFICE
DUMP SITE
DUMP LOK
DUMP
QUARRY
BOTIJA SOUTH
STORAGE FACILITY
BOTIJA NORTH
STORAGE FACILITY
BOTIJA PIT
BOTIJA CAMP
MINERA PANAMA
MINERA PANAMA CAMP
CRUSHING PLANT
CONCENTRATOR PLANT
MINERA PANAMA CAMP
MINERA PANAMA CAMP
MINERA PANAMA CAMP